

#### Engineering and Consulting, Inc.

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To: Steve Morrow From: Chris Ricardi Date: October 23, 2009

Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 2Q09–May

2009

DATA VALIDATION REPORT
MAY 2009 SLURRY WALL SURFACE WATER AND GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS
TestAmerica Laboratories Data Sets 360-22588, 360-22595, and 360-22658

#### 1.0 INTRODUCTION

Surface water and groundwater samples were collected from the Olin Chemical Superfund Site from May 11 to May 15, 2009. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-22588, 360-22595, and 360-22658. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2.

#### 2.0 METALS

Data were reviewed for the following parameters:

- \* Data Completeness
- \* Holding Time
  - Blanks
- \* Matrix Spike Analysis
- \* Laboratory Duplicate Analysis
- \* Field Duplicate Results
- \* Laboratory Control Sample



- \* Detection limits
  Dissolved vs. Total Metals Comparison
- \* = indicates that criteria were met for this parameter

#### Blanks

Dissolved aluminum (3.6  $\mu$ g/L) was reported in the method blank associated with all samples in SDG 360-22588. An action level (18  $\mu$ g/L) was calculated at five times the blank concentration and compared to sample data. The low concentration detection of dissolved aluminum in sample OC-ISCO-2 was qualified non-detect (U) at the reporting limit.

The laboratory qualified sample results with a (B) when the analyte was detected in the sample and associated method blank. The (B) qualifier was removed from the final data set.

#### Dissolved vs. Total Metals Comparison

Dissolved sodium concentrations are significantly greater than total sodium concentrations reported in a subset of samples in SDG 360-22588. The results for total and dissolved sodium in samples OC-ISCO-1, OC-ISCO-2, OC-ISCO-3, OC-PZ16RRSW, OC-PZ18RSW, and OC-SD17 are qualified estimated (J).

# 3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- \* Data Completeness
- \* Holding Time
- \* Blanks
  - Matrix Spike Analysis
- \* Laboratory Duplicate Analysis
- \* Laboratory Control Sample
- \* Detection limits
- \* = indicates that criteria were met for this parameter

#### Matrix Spike Results

An ammonia MS/MSD analysis was completed using sample OC-GW-34D. The ammonia MSD percent recovery (160) is greater than the upper project limit of 125. The relative percent difference (RPD) between the ammonia MS and MSD (25) is greater than the project QC limit of 20. The result for ammonia in the unspiked samples OC-GW-34D and OC-GW34D DUP were qualified estimated (J).



Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

Chris Ricards	8/26/09
Chris Ricardi, NRCC-EAC Senior Chemist	Date
Michael Murphy Project Principal	18/28/09 Date

#### References:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.

Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

# Table 1 Sample Summary - Sets 360-22588-1, 360-22595-1, and 360-22658-1 Data Validation Report May 2009 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

				SW846 6010B	SW846 6010B	E350.1 (QuickChem		40CFR136A
				Total	Filtered	10-107-06-1-B)	SM 2510B	300.0
Lab Sample ID	Location	Sample ID	Sample Date					
Groundwater								
360-22595-1	GW-42S	OC-GW-42S	5/11/2009		2	1	1	2
360-22595-2	GW-201S	OC-GW-201S	5/12/2009		2	1	1	2
360-22595-3	GW-35S	OC-GW-35S	5/12/2009		2	1	1	2
360-22658-1	GW-10S	OC-GW-10S	5/13/2009		2	1	1	2
360-22658-2	GW-26	OC-GW-26	5/13/2009		2	1	1	2
360-22658-3	GW-76S	OC-GW-76S	5/13/2009		2	1	1	2
360-22658-4	GW-25	OC-GW-25	5/13/2009		2	1	1	2
360-22658-5	PZ-18	OC-PZ-18R	5/13/2009		2	1	1	2
360-22658-6	GW-39	OC-GW-39	5/13/2009		2	1	1	2
360-22658-7	GW-34SR	OC-GW-34SR	5/13/2009		2	1	1	2
360-22658-8	GW-34D	OC-GW-34D	5/13/2009		2	1	1	2
360-22658-9	GW-34D	OC-GW-34D DUP	5/13/2009		2	1	1	2
360-22658-10	GW-55S	OC-GW-55S	5/14/2009		2	1	1	2
360-22658-11	PZ-17RR	OC-PZ-17RR	5/14/2009		2	1	1	2
360-22658-12	GW-CA1	OC-GW-CA1	5/14/2009		2	1	1	2
360-22658-13	GW-78S	OC-GW-78S	5/14/2009		2	1	1	2
360-22658-14	GW-24	OC-GW-24	5/14/2009		2	1	1	2
360-22658-15	PZ-16RR	OC-PZ-16RR	5/14/2009		2	1	1	2
360-22658-16	GW-202D	OC-GW-202D	5/15/2009		2	1	1	2
360-22658-17	GW-202S	OC-GW-202S	5/15/2009		2	1	1	2
360-22658-18	GW-79S	OC-GW-79S	5/15/2009		2	1	1	2
Surface Water								
360-22588-1	ISCO3	OC-ISCO-3	5/12/2009	3	3	1	1	4
360-22588-2	ISCO2	OC-ISCO-2	5/12/2009	3	3	1	1	4
360-22588-3	PZ-16RR	OC-PZ16RRSW	5/12/2009	3	3	1	1	4
360-22588-4	PZ-17RR	OC-PZ17RRSW	5/12/2009	3	3	1	1	4
360-22588-5	SD-17	OC-SD17	5/12/2009	3	3	1	1	4
360-22588-6	PZ-18R	OC-PZ18RSW	5/12/2009	3	3	1	1	4
360-22588-7	ISCO1	OC-ISCO-1	5/12/2009	3	3	1	1	4

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 06/02/09 Checked by / Date: WDC 07/29/09

# Table 2 Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1 May 2009 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

	4.5			GW-	10S	GW-	201S	GW-2	202D	GW-	202S	GW-	-24	GW	-25	GW-	-26
				OC-GV	V-10S	OC-GV	V-201S	OC-GW	/-202D	OC-GV	V-202S	OC-G	W-24	OC-G	W-25	OC-G	W-26
				05/13	3/09	05/1	2/09	05/1	5/09	05/1	5/09	05/14	1/09	05/1	3/09	05/13	3/09
				FS	3	F	S	F:	S	F	S	FS	3	F	S	FS	S
				360-22	658-1	360-22	2595-1	360-22	658-1	360-22	2658-1	360-22	658-1	360-22	2658-1	360-22	658-1
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	3100		100	U	18000		3.7	J	4 .	J	100	U	2.9	J
F	SW6010	Chromium	ug/l	5	U	14		1200		4.6	J	5	U	3.7	J	20	
N	E300	Chloride	mg/l	5.2		24		370		53		6.3		37		180	
N	E300	Sulfate	mg/l	41		1300		2600		490		68		120		160	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	1		72		360		120		36		53		74	
N	SM2510B	LAB SPECIFIC CONDUCT	ANC umhos/cm	110		2500		5000		1300		350		570		1000	

#### Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

# Table 2 Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1 May 2009 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site

Wilmington, Ma	assachusetts
----------------	--------------

				GW-34	4D	GW-	34D	GW-3	4SR	GW-	35S	GW	-39	GW-	-42S	GW-	·55S
				OC-GW-	-34D	OC-GW-3	4D DUP	OC-GV	-34SR	OC-GV	V-35S	OC-G	W-39	OC-G	W-42S	OC-GV	N-55S
				05/13/	09	05/13	3/09	05/1	3/09	05/12	2/09	05/1	3/09	05/1	1/09	05/1	4/09
				FS		F	)	F:	3	FS	S	F	S	F	S	F:	S
				360-226	58-1	360-22	658-1	360-22	658-1	360-22	595-1	360-22	2658-1	360-22	2595-1	360-22	2658-1
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	4 J		4.7	J	100	U	25	J	91	J	515		470	
F	SW6010	Chromium	ug/l	13		13		0.52	J	16		5	U	12		1.8	J
N	E300	Chloride	mg/l	14		15		1.1		6.6		19		67		180	
N	E300	Sulfate	mg/l	37		38		7.1		400		500		8		1100	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	15 J		14	J	0.27		19		0.15		0.37		15	
Ν	SM2510B	LAB SPECIFIC CONDUCT	ANC umhos/cm	210		210		65		1000		910		310	L.,	2800	

Notes:

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FD = field duplicate

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J = value is estimated

ug/l = microgram per liter

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# Table 2 Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1 May 2009 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

				GW-	76S	GW-	78S	GW-	79S	GW-	CA1	PZ-1	6RR	PZ-1	7RR	PZ-	-18
				OC-G\	N-76S	OC-G\	N-78S	OC-GV	N-79S	OC-GV	V-CA1	OC-PZ	-16RR	OC-PZ	-17RR	OC-P2	Z-18R
				05/1	3/09	05/1	4/09	05/1	5/09	05/1	4/09	05/14	4/09	05/1	4/09	05/1	3/09
				F	S	F	S	F:	S	F	S	FS	S	F	S	F:	S
				360-22	2658-1	360-22	2658-1	360-22	2658-1	360-22	658-1	360-22	658-1	360-22	2658-1	360-22	2658-1
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	7.2	J	3.4	J	18	J	6	J	100	U	100	U	3.6	J
F	SW6010	Chromium	ug/l	2.4	J	3.5	J	6.6		0.92	J	7.4		3.2	J	18	
Ν	E300	Chloride	mg/l	11		21		190		2.1		160		18		180	
N	E300	Sulfate	mg/l	38		620		1300		39		950		550		240	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	11		71		190		0.4		190		62		62	
N	SM2510B	LAB SPECIFIC CONDUCT	ANC umhos/cm	170		1400		3320		390		2600		1400		1200	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date:

KJC 07/30/09

Checked by / Date:

WDC 07/30/09

# Table 2 Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1 May 2009 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

				ISC	O1	ISC	02	ISC	O3	PZ-16	SRR	PZ-1	7RR	PZ-	18R	SD-	-17
				OC-IS	CO-1	OC-IS	CO-2	OC-IS	CO-3	OC-PZ16	RRSW	OC-PZ1	7RRSW	OC-PZ1	8RSW	OC-S	3D17
				05/12	2/09	05/12	2/09	05/12	2/09	05/12	2/09	05/1	2/09	05/1:	2/09	05/12	2/09
				FS	S	FS	S	FS	S	FS	3	F	S	F	S	FS	S
				360-22	588-1	360-22	588-1	360-22	588-1	360-22	588-1	360-22	2588-1	360-22	588-1	360-22	2588-1
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	98	J	17	U	250		20 .	J	100		94	J	130	
F	SW6010	Chromium	ug/l	12		4	J	50		12		68		12		72	
F	SW6010	Sodium	ug/l	84000	J	100000	J	100000	J	110000 .	J	120000		82000	J	120000	J
N	E300	Chloride	mg/l	120		140		140		160		160		120		160	
N	E300	Nitrate as N	mg/l	0.23		3.9		3.7		4.4		4		0.25		4.1	
N	E300	Nitrite as N	mg/l	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
N	E300	Sulfate	mg/l	110		190		190		180		220		120		220	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	24		34		41		18		36		25		35	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	700		980		960		1000		1100		700		1100	
Т	SW6010	Aluminum	ug/l	210		2500		2700		2400		2500		180		2300	
Т	SW6010	Chromium	ug/l	26		530		590		540		600		22		580	
Т	SW6010	Sodium	ug/l	75000	J	87000	J	84000	J	92000	J	110000		65000	J	100000	J

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date:

KJC 07/30/09

Checked by / Date: WDC 07/30/09

## **FILE COPY**



## ANALYTICAL REPORT

Job Number: 360-22588-1

Job Description: Slurry Wall/Cap

For: Corporation

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

Joseph a. Chem).

Approved for release.
Joe Chimi
Report Production Representative

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
05/27/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002



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Laborator	y Name:	TestAmeri	ca Westfield		Proj	ect #:	360-	22588	-1
Project Lo	cation:	Slurry Wall	/ Cap		MADEP F	RTN <sup>1</sup> :			
	•	cations for the f	ollowing data set	t:[list Laborator	/ Sample ID Nur	nber(s)]			
360-22588	3-(1-7)								
Sample M		Groundwater		ediment	Drinking Wate				
MCP SW		8260B( )	8151A ( )	8330 ( )	6010B (x)	7470A/1A (		Othe	r ( )
Methods	ed in MADEP	8270C( ) 8082 ( )	8081A ( ) 8021B ( )	VPH()	6020 ( ) 7000 S <sup>3</sup> ( )	9014M <sup>2</sup> /90 7196A ( )	` '		
as specifi Compend		` ,	e Tracking Numb	. ,	` '	71307()			
•	Methods.		6 Method 9014 o	, , ,		ble Cyanid	e (PAC	) Metho	d
check all	that apply)	3 S - SW-846	Methods 7000 S	Series List indi	vidual method ar	nd analyte.			
An aff	irmative respo	nse to question	ons A, B, C and	D is required t	or "Presumptiv	e Certaint	y" statı	ıs	
Α	Were all samp	ples received b	y the laboratory in	n a condition co	onsistent with		Yes		No <sup>1</sup>
	that described	d on the Chain-	of-Custody docur	mentation for th	e data set?		$\sqrt{}$		
	Were all QA/0	QC procedures	required for the s	specified analyt	ical method(s)		Yes		No <sup>1</sup>
В		•	d, including the r		, ,		$\sqrt{}$		
	discuss in a na	arrative QC dat	a that did not me	eet appropriate	performance				
	standards or o	guidelines?							
	Does the anal	lytical data inclu	ıded in this repor	t meet all the re	equirements		Yes	N/A	No <sup>1</sup>
С	for "Presumpt	rive Certainty",	as described in S	Section 2.0 (a),	(b), (c) and (d) o	f	$\sqrt{}$		
			VII A, " Quality A		•				
	Control Guide	lines for the Ac	quisition and Rep	porting of Analy	rtical Data"?				
	VPH and EPH	I methods onl	y: Was the VPH	or EPH Method	d conducted with	out	Yes	N/A	No <sup>1</sup>
D	significant mo	difications (see	Section 11.3 of	respective Met	hods)?			$\sqrt{}$	
	A		- C			Cantaintu			
			s E and F below			Certainty		<u>s</u>	1
E		oerformance sta hods achieved?	andards and reco	ommendations	for the		Yes √		No <sup>1</sup>
F				omonto for the	an a sifi a d		•	NI/A	No.1
г	method(s) rep	•	st compounds/ele	ements for the	specified		Yes	N/A	No¹ √
	metriod(3) rep	orteu:							•
	<sup>1</sup> All Negative	responses mus	t be addressed in	n an attached F	nvironmental La	horatory ca	ase nari	rative	
the und			ains and penalti					auvo.	
	_	-	ning the informa				, i i di		
analytical	report is, to th	he best of my	knowledge and	belief, accura	te and complete	<b>)</b> .			
		1.	- /-/						
	Signature:	St	Fasture		Position:	Laborato	ry Dire	ctor	
	Printed Name:	: Steven C. H	artmann		Date:		5/27/09	16:01	
he certification	form has been electronica					A, Rev 3.2	·		oril-04
	· ·	MADEP MA014	NELAP FL E87912 TOX		TestAmerica Westfield				
Test <sub>A</sub>	merica	NY DOH 10843	NELAP NJ MA008 TOX		53 Southampton Rd,				
	MERICA ENVIRONMENTAL TESTING	NY DOH 10843 RI DOH 57 CT DPH 0494	NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A	GIEC IN ACCORDAN	53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000				

Laboratory	y Name:	TestAmeric	ca Westfield		Proj	ect #:	360-	22588	-1
Project Lo	cation:	Slurry Wall	/ Cap		MADEP F	RTN <sup>1</sup> :			
	•	cations for the f	ollowing data set	::[list Laborator	/ Sample ID Nun	nber(s)]			
860-22588	3-(1-7)								
Sample M		Groundwater		ediment	Drinking Wate				
MCP SW		8260B( )	8151A ( )	8330 ( )	6010B ( )	7470A/1A (		Other	( <b>x</b> )
Methods	ed in MADEP	8270C( ) 8082 ( )	8081A ( ) 8021B ( )	VPH()	6020 ( ) 7000 S <sup>3</sup> ( )	9014M <sup>2</sup> /90 <sup>2</sup> 7196A ( )	12()		
as specific Compendi		` ,	e Tracking Numb	. , ,	` '	7 130A ( )			
•	Methods.		6 Method 9014 o	, ,		ble Cyanide	(PAC	) Metho	d
check all	that apply)	3 S - SW-846	Methods 7000	Series List indi	vidual method ar	nd analyte.			
An aff	irmative respo	nse to questic	ons A, B, C and	D is required	or "Presumptiv	e Certainty	' statı	us	
Α	Were all samp	oles received by	y the laboratory is	n a condition co	onsistent with		Yes		No <sup>1</sup>
	that described	I on the Chain-o	of-Custody docur	mentation for th	e data set?		$\checkmark$		
	Were all QA/C	QC procedures	required for the s	specified analy	ical method(s)		Yes		No <sup>1</sup>
В		•	d, including the r		, ,		$\checkmark$		
	discuss in a na	arrative QC dat	a that did not me	eet appropriate	performance				
	standards or g	guidelines?							
	Does the anal	ytical data inclu	ided in this repor	t meet all the re	equirements		Yes	N/A	No <sup>1</sup>
С	for "Presumpt	ive Certainty", a	as described in S	Section 2.0 (a),	(b), (c) and (d) o	•		$\checkmark$	
			VII A, " Quality A		•				
	Control Guide	lines for the Ac	quisition and Rep	porting of Analy	rtical Data"?				
	VPH and EPH	l methods onl	y: Was the VPH	or EPH Metho	d conducted with	out	Yes	N/A	No <sup>1</sup>
D	significant mo	difications (see	Section 11.3 of	respective Met	hods)?			$\sqrt{}$	
	A respons	se to question	s E and F belov	v is required for	or "Presumptive	Certainty"	statu	S	4
E	·		andards and reco	mmendations	for the		Yes		No <sup>1</sup>
		nods achieved?					√ 		1
F		•	st compounds/el	ements for the	specified		Yes	N/A	No <sup>1</sup>
	method(s) rep	ortea?						V	
	<sup>1</sup> All Mogative	rocponeoe mue	t be addressed in	n an attached [	Environmental La	horatory oad	o por	rativa	
the und								alive.	
	_	-	ains and penalti ning the informa		· · · · · · · · · · · · · · · · · · ·		ıaı		
	-		knowledge and						
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	Signature:	ST	Hostin		Position:	Laboratory	/ Dire	ctor	
	Printed Name:	Steven C. H	artmann		Date:	5	/27/09	16:01	
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		MADEP MA014	NELAP FL E87912 TOX		TestAmerica Westfield	, 3.2			, • .
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TestA	merica	NY DOH 10843	NELAP NJ MA008 TOX		53 Southampton Rd,				
TestA	merica ENVIRONMENTAL TESTING	NY DOH 10843 RI DOH 57 CT DPH 0494	NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A	LED IN ACCORDAN	53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000				

#### **CASE NARRATIVE**

**Client: Olin Corporation** 

Project: Slurry Wall/Cap

Report Number: 360-22588-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/13/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.2°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

#### **TOTAL METALS**

Samples 360-22588-1 through 360-22588-7 were analyzed for total metals in accordance with EPA SW846 Method 6010B. The samples were prepared and analyzed on 05/14/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

#### General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

#### **DISSOLVED METALS**

Samples 360-22588-1 through 360-22588-7 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/14/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

#### General method information:

Aluminum was detected in method blank MB 360-44463/2 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

#### **ANIONS**

Samples 360-22588-1 through 360-22588-7 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/13/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22588-1 through 360-22588-7(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

#### <u>AMMONIA</u>

Samples 360-22588-1 through 360-22588-7 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/22/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22588-1(5X), 360-22588-2(5X) and 360-22588-4 through 360-22588-7(5X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

#### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22588-1 through 360-22588-7 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/13/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-1	OC-ISCO-3				
Aluminum		2700	100	ug/L	6010B
Chromium		590	5.0	ug/L	6010B
Sodium		84000 🍮	2000	ug/L	6010B
Sulfate		190	20	mg/L	300.0
Nitrate as N		3.7	0.050	mg/L	300.0
Chloride		140	10	mg/L	300.0
Ammonia		41	0.50	mg/L	L107-06-1B
Specific Conductanc	е	960	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		250 B	100	ug/L	6010B
Chromium		50	5.0	ug/L	6010B
Sodium		100000 🍮	2000	ug/L	6010B
360-22588-2	OC-ISCO-2				
Aluminum		2500	100	ug/L	6010B
Chromium		530	5.0	ug/L	6010B
Sodium		87000 3	2000	ug/L	6010B
Sulfate		190	20	mg/L	300.0
Nitrate as N		3.9	0.050	mg/L	300.0
Chloride		140	10	mg/L	300.0
Ammonia		34	0.50	mg/L	L107-06-1B
Specific Conductanc	е	980	1.0	umhos/cm	CM 2E10D
Dissolved					5010B W With
Aluminum		17 J-B	100	ug/L	6010B (W) x/21
Chromium		4.0 J	5.0	ug/L	6010B
Sodium		100000 3	2000	ug/L	6010B
360-22588-3	OC-PZ16RRSW				
Aluminum	OO I E IOIIIIOI	2400	100	ug/L	6010B
Chromium		540	5.0	ug/L	6010B
Sodium		92000 7	2000	ug/L	6010B
Sulfate		180	20	mg/L	300.0
Nitrate as N		4.4	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		18	0.10	mg/L	L107-06-1B
Specific Conductanc	e	1000	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		20 J B	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		110000 3	2000	ug/L	6010B
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### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-4	OC-PZ17RRSW				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductan	се	2500 600 110000 220 4.0 160 36 1100	100 5.0 2000 20 0.050 10 0.50 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		100 B 68 120000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-22588-5	OC-SD17				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductan	ce	2300 580 100000	100 5.0 2000 20 0.050 10 0.50 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		130 B 72 120000 J	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-22588-6	OC-PZ18RSW				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductan	ice	180 22 65000 120 0.25 120 25 700	100 5.0 2000 20 0.050 10 0.50 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		94 JB 12 82000 <del>T</del>	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B

TestAmerica Westfield

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### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation

Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-7	OC-ISCO-1				
Aluminum		210	100	ug/L	6010B
Chromium		26	5.0	ug/L	6010B
Sodium		75000 🍱	2000	ug/L	6010B
Sulfate		110	20	mg/L	300.0
Nitrate as N		0.23	0.050	mg/L	300.0
Chloride		120	10	mg/L	300.0
Ammonia		24	0.50	mg/L	L107-06-1B
Specific Conductan	ice	700	1.0	umhos/cm	SM 2510B
Dissolved		E 769			
Aluminum		98 J.B	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		84000 3	2000	ug/L	6010B

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#### **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-22588-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals	TAL WFD	SW846 6010B
Total Metals Sample Filtration, Field Preparation, Total Metals	TAL WFD TAL WFD TAL WFD	SW846 6010B FIELD_FLTRD SW846 3010A
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia Distillation, Ammonia	TAL WFD TAL WFD	LACHAT L107-06-1B Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

#### Lab References:

TAL WFD = TestAmerica Westfield

#### **Method References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### **METHOD / ANALYST SUMMARY**

Client: Olin Corporation Job Number: 360-22588-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

### **SAMPLE SUMMARY**

Client: Olin Corporation Job Number: 360-22588-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-22588-1	OC-ISCO-3	Water	05/12/2009 1240	05/13/2009 0950
360-22588-2	OC-ISCO-2	Water	05/12/2009 1310	05/13/2009 0950
360-22588-3	OC-PZ16RRSW	Water	05/12/2009 1315	05/13/2009 0950
360-22588-4	OC-PZ17RRSW	Water	05/12/2009 1355	05/13/2009 0950
360-22588-5	OC-SD17	Water	05/12/2009 1345	05/13/2009 0950
360-22588-6	OC-PZ18RSW	Water	05/12/2009 1405	05/13/2009 0950
360-22588-7	OC-ISCO-1	Water	05/12/2009 1420	05/13/2009 0950

# **SAMPLE RESULTS**

Job Number: 360-22588-1

Client Sample ID: OC-ISCO-3 Lab Sample ID: 360-22588-1 Date Sampled: 05/12/2009 1240 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Qualifie	r Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	Analyzed:	05/14/2009 1824	
Aluminum	250 ⋅E	ug/L	2.2	100	1.0
Chromium	50	ug/L	0.17	5.0	1.0
Sodium	100000 🍜	ug/L	65	2000	1.0
Method: 6010B		Date A	Analyzed:	05/14/2009 1631	
Prep Method: 3010A		Date F	Prepared:	05/14/2009 0712	
Aluminum	2700	ug/L	2.2	100	1.0
Chromium	590	ug/L	0.17	5.0	1.0
Sodium	84000 🍮	ug/L	65	2000	1.0

Malika Alaston

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-ISCO-3
 Date Sampled:
 05/12/2009
 1240

 Lab Sample ID:
 360-22588-1
 Date Received:
 05/13/2009
 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/13/2009 1837	
Nitrate as N	3.7	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed:	05/13/2009 1852	
Sulfate	190	mg/L	20	20	10
Chloride	140	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed:	05/22/2009 1411	
Prep Method: Distill/Ammonia		Date Prep	•	05/22/2009 0850	
Ammonia	41	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed:	05/13/2009 1331	
Specific Conductance	960	umhos/cm	1.0	1.0	1.0

Client Sample ID: OC-ISCO-2 Lab Sample ID: 360-22588-2 Date Sampled: 05/12/2009 1310 Date Received: 05/13/2009 0950

Job Number: 360-22588-1

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed:	05/14/2009 1827	
Aluminum	47 100 U -J-B-	ug/L	2.2	100	1.0
Chromium	4.0 J	ug/L	0.17	5.0	1.0
Sodium	100000 🍏	ug/L	65	2000	1.0
Method: 6010B		Date Analyzed: 05/14/2009 1634		05/14/2009 1634	
Prep Method: 3010A		Date P	repared:	05/14/2009 0712	
Aluminum	2500	ug/L	2.2	100	1.0
Chromium	530	ug/L	0.17	5.0	1.0
Sodium	87000 ~	ug/L	65	2000	1.0



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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-ISCO-2
 Date Sampled:
 05/12/2009 1310

 Lab Sample ID:
 360-22588-2
 Date Received:
 05/13/2009 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/13/2009 1907	
Nitrate as N	3.9	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed:	05/13/2009 1922	
Sulfate	190	mg/L	20	20	10
Chloride	140	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed:	05/22/2009 1410	
Prep Method: Distill/Ammonia		Date Prep	oared:	05/22/2009 0850	
Ammonia	34	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed:	05/13/2009 1332	
Specific Conductance	980	umhos/cm	1.0	1.0	1.0

Job Number: 360-22588-1

Client Sample ID: OC-PZ16RRSW Lab Sample ID: 360-22588-3

Date Sampled: 05/12/2009 1315 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Q	ualifier	Unit	MDL	RL	Dilution
		•				
Method: Dissolved-6010B			Date A	nalyzed: 0	05/14/2009 1829	
Aluminum	20	J.B	ug/L	2.2	100	1.0
Chromium	12		ug/L	0.17	5.0	1.0
Sodium	110000	.2	ug/L	65	2000	1.0
Method: 6010B			Date A	nalyzed: 0	5/14/2009 1637	
Prep Method: 3010A			Date P	repared: 0	5/14/2009 0712	
Aluminum	2400		ug/L	2.2	100	1.0
Chromium	540		ug/L	0.17	5.0	1.0
Sodium	92000	2	ug/L	65	2000	1.0

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Cleveland, TN 37312-4441

Client Sample ID: OC-PZ16RRSW Lab Sample ID: 360-22588-3 Date Sampled: 05/12/2009 1315 Date Received: 05/13/2009 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed: 05	/13/2009 1937	
Nitrate as N	4.4	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed: 05	/13/2009 1952	
Sulfate	180	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed: 05	/22/2009 1356	
Prep Method: Distill/Ammonia		Date Prep	oared: 05	/22/2009 0850	
Ammonia	18	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed: 05	/13/2009 1334	
Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

Job Number: 360-22588-1

Client Sample ID: OC-PZ17RRSW Lab Sample ID: 360-22588-4 Date Sampled: 05/12/2009 1355 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Quali	fier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed:	05/14/2009 1832	
Aluminum	100	-B	ug/L	2.2	100	1.0
Chromium	68		ug/L	0.17	5.0	1.0
Sodium	120000 ~~		ug/L	65	2000	1.0
Method: 6010B			Date A	nalyzed:	05/14/2009 1639	
Prep Method: 3010A			Date P	repared:	05/14/2009 0712	
Aluminum	2500		ug/L	2.2	100	1.0
Chromium	600		ug/L	0.17	5.0	1.0
Sodium	110000		ug/L	65	2000	1.0

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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-PZ17RRSW
 Date Sampled:
 05/12/2009
 1355

 Lab Sample ID:
 360-22588-4
 Date Received:
 05/13/2009
 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/13/2009 2108	
Nitrate as N	4.0	mg/L	0.05	0 0.050	1.0
Method: 300.0		Date Ana	lyzed:	05/13/2009 2123	
Sulfate	220	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed:	05/22/2009 1411	
Prep Method: Distill/Ammonia		Date Prep	•	05/22/2009 0850	
Ammonia	36	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed:	05/13/2009 1335	
Specific Conductance	1100	umhos/cm	1.0	1.0	1.0

Job Number: 360-22588-1

Client Sample ID: OC-SD17 Lab Sample ID: 360-22588-5 Date Sampled: 05/12/2009 1345 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Qualifie	er Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date	e Analyzed:	05/14/2009 1835	
Aluminum	130 <b>&amp;</b>	g/L	2.2	100	1.0
Chromium	72	ug/L	0.17	5.0	1.0
Sodium	120000 了	ug/L	65	2000	1.0
Method: 6010B		Date	e Analyzed:	05/14/2009 1642	
Prep Method: 3010A				05/14/2009 0712	
Aluminum	2300	ug/L	2.2	100	1.0
Chromium	580	ug/L	0.17	5.0	1.0
Sodium	100000 🍮	ug/L	65	2000	1.0

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 Client Sample ID:
 OC-SD17
 Date Sampled:
 05/12/2009
 1345

 Lab Sample ID:
 360-22588-5
 Date Received:
 05/13/2009
 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/13/2009 2208	
Nitrate as N	4.1	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed:	05/13/2009 2224	
Sulfate	220	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed:	05/22/2009 1412	
Prep Method: Distill/Ammonia		Date Prep	oared:	05/22/2009 0850	
Ammonia	35	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Analyzed: 05/13/2009 1337			
Specific Conductance	1100	umhos/cm	1.0	1.0	1.0

Job Number: 360-22588-1

Client Sample ID: OC-PZ18RSW Lab Sample ID: 360-22588-6 Date Sampled: 05/12/2009 1405 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed:	05/14/2009 1844	
Aluminum	94 J.B	ug/L	2.2	100	1.0
Chromium	12	ug/L	0.17	5.0	1.0
Sodium	82000	ug/L	65	2000	1.0
Method: 6010B		Date A	nalyzed:	05/14/2009 1645	
Prep Method: 3010A		Date P	repared:	05/14/2009 0712	
Aluminum	180	ug/L	2.2	100	1.0
Chromium	22	ug/L	0.17	5.0	1.0
Sodium	65000 🏅	ug/L	65	2000	1.0

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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-PZ18RSW
 Date Sampled:
 05/12/2009
 1405

 Lab Sample ID:
 360-22588-6
 Date Received:
 05/13/2009
 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/13/2009 2239	
Nitrate as N	0.25	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed:	05/13/2009 2254	
Sulfate	120	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed:	05/22/2009 1413	
Prep Method: Distill/Ammonia		Date Prep	•	05/22/2009 0850	
Ammonia	25	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed:	05/13/2009 1338	
Specific Conductance	700	umhos/cm	1.0	1.0	1.0

Job Number: 360-22588-1

Client Sample ID: OC-ISCO-1 Lab Sample ID: 360-22588-7 Date Sampled: 05/12/2009 1420 Date Received: 05/13/2009 0950

Client Matrix: Water

Analyte	Result/Qu	ıalifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed:	05/14/2009 1847	
Aluminum	98	J.B	ug/L	2.2	100	1.0
Chromium	12		ug/L	0.17	5.0	1.0
Sodium	84000	7	ug/L	65	2000	1.0
Method: 6010B			Date A	nalyzed:	05/14/2009 1648	
Prep Method: 3010A			Date P	repared:	05/14/2009 0712	
Aluminum	210		ug/L	2.2	100	1.0
Chromium	26		ug/L	0.17	5.0	1.0
Sodium	75000	7	ug/L	65	2000	1.0

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Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-ISCO-1 Lab Sample ID: 360-22588-7 Date Sampled: 05/12/2009 1420 Date Received: 05/13/2009 0950

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed: C	05/13/2009 2309	
Nitrate as N	0.23	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed: C	05/13/2009 2324	
Sulfate	110	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Ana	lyzed: C	05/22/2009 1414	
Prep Method: Distill/Ammonia		Date Prep	pared: C	05/22/2009 0850	
Ammonia	24	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed: C	05/13/2009 1340	
Specific Conductance	700	umhos/cm	1.0	1.0	1.0

## **DATA REPORTING QUALIFIERS**

Client: Olin Corporation Job Number: 360-22588-1

Lab Section	Qualifier	Description
Metals		
motalo		
	В	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## **QUALITY CONTROL RESULTS**

Client: Olin Corporation Job Number: 360-22588-1

## **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals	·				•
Prep Batch: 360-44407					
LCS 360-44407/2-A	Lab Control Sample	Т	Water	3010A	
LCSD 360-44407/3-A	Lab Control Sample Duplicate	Т	Water	3010A	
MB 360-44407/1-A	Method Blank	Т	Water	3010A	
360-22588-1	OC-ISCO-3	Т	Water	3010A	
360-22588-2	OC-ISCO-2	Т	Water	3010A	
360-22588-3	OC-PZ16RRSW	Т	Water	3010A	
360-22588-4	OC-PZ17RRSW	Т	Water	3010A	
360-22588-5	OC-SD17	Т	Water	3010A	
360-22588-6	OC-PZ18RSW	Т	Water	3010A	
360-22588-7	OC-ISCO-1	Т	Water	3010A	
Analysis Batch:360-444					
LCS 360-44407/2-A	Lab Control Sample	T	Water	6010B	360-44407
LCSD 360-44407/3-A	Lab Control Sample Duplicate	T	Water	6010B	360-44407
MB 360-44407/1-A	Method Blank	T	Water	6010B	360-44407
360-22588-1	OC-ISCO-3	T	Water	6010B	360-44407
360-22588-2	OC-ISCO-2	T	Water	6010B	360-44407
360-22588-3	OC-PZ16RRSW	T	Water	6010B	360-44407
360-22588-4	OC-PZ17RRSW	T	Water	6010B	360-44407
360-22588-5	OC-SD17	Т	Water	6010B	360-44407
360-22588-6	OC-PZ18RSW	Т	Water	6010B	360-44407
360-22588-7	OC-ISCO-1	Т	Water	6010B	360-44407
Analysis Batch:360-444					
LCS 360-44463/1	Lab Control Sample	Т	Water	6010B	
LCSD 360-44463/4	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-44463/2	Method Blank	Т	Water	6010B	
360-22588-1	OC-ISCO-3	D	Water	6010B	
360-22588-2	OC-ISCO-2	D	Water	6010B	
360-22588-3	OC-PZ16RRSW	D	Water	6010B	
360-22588-4	OC-PZ17RRSW	D	Water	6010B	
360-22588-5	OC-SD17	D	Water	6010B	
360-22588-6	OC-PZ18RSW	D	Water	6010B	
360-22588-7	OC-ISCO-1	D	Water	6010B	

### Report Basis

D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-22588-1

## **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry	·				-
Analysis Batch:360-44	423				
LCS 360-44423/1	Lab Control Sample	Т	Water	SM 2510B	
MB 360-44423/2	Method Blank	Т	Water	SM 2510B	
360-22588-1	OC-ISCO-3	T	Water	SM 2510B	
360-22588-2	OC-ISCO-2	T	Water	SM 2510B	
360-22588-3	OC-PZ16RRSW	T	Water	SM 2510B	
360-22588-4	OC-PZ17RRSW	T	Water	SM 2510B	
360-22588-5	OC-SD17	Т	Water	SM 2510B	
360-22588-6	OC-PZ18RSW	Т	Water	SM 2510B	
360-22588-7	OC-ISCO-1	Т	Water	SM 2510B	
Analysis Batch:360-44	452				
LCS 360-44452/2	Lab Control Sample	T	Water	300.0	
MB 360-44452/1	Method Blank	T	Water	300.0	
360-22588-1	OC-ISCO-3	T	Water	300.0	
360-22588-2	OC-ISCO-2	T	Water	300.0	
360-22588-3	OC-PZ16RRSW	Т	Water	300.0	
Analysis Batch:360-44	453				
LCS 360-44453/2	Lab Control Sample	T	Water	300.0	
MB 360-44453/1	Method Blank	T	Water	300.0	
360-22588-4	OC-PZ17RRSW	T	Water	300.0	
360-22588-4MS	Matrix Spike	T	Water	300.0	
360-22588-4MSD	Matrix Spike Duplicate	Т	Water	300.0	
360-22588-5	OC-SD17	T	Water	300.0	
360-22588-6	OC-PZ18RSW	T	Water	300.0	
360-22588-7	OC-ISCO-1	Т	Water	300.0	
Analysis Batch:360-44	454				
LCS 360-44454/2	Lab Control Sample	T	Water	300.0	
MB 360-44454/1	Method Blank	T	Water	300.0	
360-22588-1	OC-ISCO-3	T	Water	300.0	
360-22588-2	OC-ISCO-2	T	Water	300.0	
360-22588-3	OC-PZ16RRSW	Т	Water	300.0	
Analysis Batch:360-44	455				
LCS 360-44455/2	Lab Control Sample	Т	Water	300.0	
MB 360-44455/1	Method Blank	Т	Water	300.0	
360-22588-4	OC-PZ17RRSW	T	Water	300.0	
360-22588-4MS	Matrix Spike	Т	Water	300.0	
360-22588-4MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22588-5	OC-SD17	Т	Water	300.0	
360-22588-6	OC-PZ18RSW	T	Water	300.0	
360-22588-7	OC-ISCO-1	Т	Water	300.0	

Client: Olin Corporation Job Number: 360-22588-1

## **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-4472	8				
LCS 360-44728/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44728/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22588-1	OC-ISCO-3	T	Water	Distill/Ammonia	
360-22588-2	OC-ISCO-2	T	Water	Distill/Ammonia	
360-22588-3	OC-PZ16RRSW	T	Water	Distill/Ammonia	
360-22588-4	OC-PZ17RRSW	Т	Water	Distill/Ammonia	
360-22588-5	OC-SD17	T	Water	Distill/Ammonia	
360-22588-6	OC-PZ18RSW	T	Water	Distill/Ammonia	
360-22588-7	OC-ISCO-1	Т	Water	Distill/Ammonia	
Analysis Batch:360-4	4744				
LCS 360-44728/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44728
MB 360-44728/1-A	Method Blank	Т	Water	L107-06-1B	360-44728
360-22588-1	OC-ISCO-3	T	Water	L107-06-1B	360-44728
360-22588-2	OC-ISCO-2	Т	Water	L107-06-1B	360-44728
360-22588-3	OC-PZ16RRSW	T	Water	L107-06-1B	360-44728
360-22588-4	OC-PZ17RRSW	T	Water	L107-06-1B	360-44728
360-22588-5	OC-SD17	T	Water	L107-06-1B	360-44728
360-22588-6	OC-PZ18RSW	T	Water	L107-06-1B	360-44728
360-22588-7	OC-ISCO-1	Т	Water	L107-06-1B	360-44728

### Report Basis

T = Total

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44407 Method: 6010B Preparation: 3010A

Lab Sample ID: MB 360-44407/1-A Analysis Batch: 360-44460 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-44407 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 50 mL Date Analyzed: 05/14/2009 1530 Final Weight/Volume: 50 mL

Date Analyzed: 05/14/2009 1530 Final Weight/Volume: 50 mL Date Prepared: 05/14/2009 0712

Analyte	Result	Qual	MDL	RL
Aluminum	ND		2.2	100
Chromium	ND		0.17	5.0
Sodium	ND		65	2000

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 360-44407

Method: 6010B
Preparation: 3010A

LCS Lab Sample ID: LCS 360-44407/2-A Analysis Batch: 360-44460 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-44407 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 50 mL

Date Analyzed: 05/14/2009 1533 Final Weight/Volume: 50 mL

Date Prepared: 05/14/2009 0712

LCSD Lab Sample ID: LCSD 360-44407/3-A Analysis Batch: 360-44460 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-44407 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 50 mL

Date Analyzed: 05/14/2009 1536 Final Weight/Volume: 50 mL

Date Prepared: 05/14/2009 0712

% Rec. **RPD** Analyte LCS LCSD Limit RPD Limit LCS Qual LCSD Qual Aluminum 101 100 80 - 120 0 20 20 Chromium 102 102 80 - 120 0 Sodium 98 98 80 - 120 1 20

Job Number: 360-22588-1 Client: Olin Corporation

Method Blank - Batch: 360-44463 Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-44463/2 Analysis Batch: 360-44463 Instrument ID: Varian 720 ES ICP

Prep Batch: N/A Client Matrix: Water Lab File ID: N/A Units: ug/L Initial Weight/Volume: Dilution: 1.0

Date Analyzed: 05/14/2009 1731 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte	Result	Qual	MDL	RL
Aluminum	3.6	J	2.2	100
Chromium	ND		0.17	5.0
Sodium	ND		65	2000

Lab Control Sample/ Method: 6010B Lab Control Sample Duplicate Recovery Report - Batch: 360-44463 Preparation: N/A

LCS Lab Sample ID: LCS 360-44463/1 Analysis Batch: 360-44463 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

05/14/2009 1729 Final Weight/Volume: Date Analyzed: 10 mL

Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-44463/4 Analysis Batch: 360-44463 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Units: ug/L Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 05/14/2009 1803 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. **RPD** Analyte LCS LCSD Limit RPD Limit LCS Qual LCSD Qual Aluminum 99 99 80 - 120 0 20 80 - 120 20 Chromium 99 98 1 Sodium 98 98 80 - 120 0 20

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44452 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44452/1 Analysis Batch: 360-44452 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 1405 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Nitrate as N
 ND
 0.050
 0.050

 Nitrite as N
 ND
 0.010
 0.010

Lab Control Sample - Batch: 360-44452 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44452/2 Analysis Batch: 360-44452 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 1420 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual Nitrate as N 4.00 4.01 85 - 115 100 Nitrite as N 85 - 115 4.00 4.10 102

85 - 115

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44453 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44453/1 Analysis Batch: 360-44453 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2038 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Nitrate as N
 ND
 0.050
 0.050

 Nitrite as N
 ND
 0.010
 0.010

Lab Control Sample - Batch: 360-44453 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44453/2 Analysis Batch: 360-44453 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

4.00

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2053 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Spike Amount
 Result
 % Rec.
 Limit
 Qual

 Nitrate as N
 4.00
 4.09
 102
 85 - 115

4.09

102

Calculations are performed before rounding to avoid round-off errors in calculated results.

Nitrite as N

Client: Olin Corporation Job Number: 360-22588-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-44453 Preparation: N/A

MS Lab Sample ID: 360-22588-4 Analysis Batch: 360-44453 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2138 Final Weight/Volume: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-22588-4 Analysis Batch: 360-44453 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2153 Final Weight/Volume: 10 mL Date Prepared: N/A

% Rec. MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Analyte Nitrate as N 75 - 125 93 94 0 20 Nitrite as N 102 102 75 - 125 0 20

85 - 115

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44454 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44454/1 Analysis Batch: 360-44454 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 1405 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44454 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44454/2 Analysis Batch: 360-44454 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

40.0

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 1420 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual
Sulfate 80.0 81.4 102 85 - 115

40.6

102

Calculations are performed before rounding to avoid round-off errors in calculated results.

Chloride

Qual

85 - 115

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44455 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44455/1 Analysis Batch: 360-44455 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 05/13/2009 2038 Final Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2038 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44455 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44455/2 Analysis Batch: 360-44455 Instrument ID: No Equipment Assigned

40.8

102

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

40.0

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2053 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Spike Amount
 Result
 % Rec.
 Limit

 Sulfate
 80.0
 82.1
 103
 85 - 115

Calculations are performed before rounding to avoid round-off errors in calculated results.

Chloride

Client: Olin Corporation Job Number: 360-22588-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-44455 Preparation: N/A

MS Lab Sample ID: 360-22588-4 Analysis Batch: 360-44455 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2138 Final Weight/Volume: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-22588-4 Analysis Batch: 360-44455 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/13/2009 2153 Final Weight/Volume: 10 mL Date Prepared: N/A

% Rec. MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Analyte Sulfate 75 - 125 105 104 0 20 Chloride 100 99 75 - 125 0 20

Job Number: 360-22588-1 Client: Olin Corporation

Method Blank - Batch: 360-44728 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-44728/1-A

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 05/22/2009 1345 Date Prepared: 05/22/2009 0850 Analysis Batch: 360-44744

Prep Batch: 360-44728

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44728 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-44728/2-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/22/2009 1346

Date Prepared: 05/22/2009 0850

Analysis Batch: 360-44744

Prep Batch: 360-44728

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.36	94	85 - 115	

Client: Olin Corporation Job Number: 360-22588-1

Method Blank - Batch: 360-44423 Method: SM 2510B

Preparation: N/A

N/A

Lab File ID:

Lab Sample ID: MB 360-44423/2 Analysis Batch: 360-44423 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A
Dilution: 1.0 Units: umhos/cm

umhos/cm Initial Weight/Volume:

Date Analyzed: 05/13/2009 1243 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Result Qual RL RL
Specific Conductance ND 1.0 1.0

Lab Control Sample - Batch: 360-44423 Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-44423/1 Analysis Batch: 360-44423 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 05/13/2009 1221 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual
Specific Conductance 1410 1430 101 85 - 115

				State Approditatio	n	
		New York		State Accreditation	Florida	1
Method Name	Description	(NELAC)	Mass	Conn	(NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)	( - /			NP	
SM 4500 CI F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		Р			
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		Р			
SM 9222B	Coliforms, Total (Membrane Filter)		Р			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		1
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		Р	P		+
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		+
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP NP		NP		
3540C	Soxhlet Extraction	141		141		
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)	Ovv	NP	NP		-
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW	141	NP/SW		-
8082A		NP/SW		NP/SW		
	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		-
8270C CT ETPH	Semivolatile Comp.(GC/MS)(list upon request)	INF/SW		NP/SW		
	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		NP/SW
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	Р	P	P P		INF/SVV
524.2	Volatile Org Comp (GC/MS)(list upon request)	Г	P	P		
524.2	Trihalomethanes	NP	NP	NP		
624	Volatile Org Comp (GC/MS)(list upon request)	SW	INP	SW		
5035	Closed System Purge and Trap	NP		NP		
5030B	Purge and Trap					
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		ND/CW/
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric	ND/D	P ND/D	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW NP	NB	SW NP		
10-107-06-2	Nitrogen, Total Kjeldahl		NP			
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	Р	NP/P		1
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total	.,=	NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		1
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P		
_				_	_	

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory This listing is subject to change based on the laboratories certification standing.

## **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-22588-1

Login Number: 22588 List Source: TestAmerica Westfield

Creator: McDonald, Jerry

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.2C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica Laboratories, Inc. Chain of Custody Form

Test/merica

 53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

•149 Rangeway Road
N. Billerica, MA 01862
(P) 978-667-1400
(F) 978-667-7871

Westfie (P) 41

Chain of Custody Form	- 「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、「大学のでは、	360- 2258	(F) 413-572-3707 (F) 978-667-7871
Cleant: Olin Chemical/MACTEC	Project #: 7 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Job#	<b>PO#</b>
Address: 51 Earnes Street	7	Shaded areas for office use	Comments
Wilmington, MA 01887	40	Check analysis and specify method	(Special Instructions)
	Shapman	ection.	MCP case narrative
equested Turn Aro	Regulatory Classification / Special Report Format	500-series for drinking water	-
10 Business Day (Std) XX   Rush TAT Requested:	Drinking Water DEP Form(s)	8000-series for haz/solid waste	
siness Day 24 hrs 72 hrs	RCRA MCP GW1/S1 MWRA Smart Rpt U	Use comments section to further define.	
	Preservative 1	S	
WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other	Glass(G) MeOH H < 2 C Mitrogen C C C C C AC C C AC C C C C Mitrogen C C C C Mitrogen C C C C C C C C C C C C C C C C C C C	ter metal ter metal	
Sample ID Sample Type Sampler's Initials	Collected Containe Containe Containe Containe Containe Prestic(P) or NaHSO4/N HAO3 to p H2SO4 to HCI to pH H2SO4 to MaOH/ZN/N NaOH/ZN/N	Nitrate, Nitrate, Nitrate, Nitracewa Sediment: Other Other Other Other	
2	5-12-09 X 4 P 21 1XXX	X	
DC - 15 CC - 7	9 X 4P 21 1X X X	X	Groundwater Metals: Dissolved Al/Cr
WS WERESW SW	5-12-09 X 4P 21 1XXX	X	Surfacewater Metals: Dissolved/Total
~ PZ17 FESW	5-12-09 X 4P 21 1X XX	X	Al/Cr/Na
ms 1145	5-12-00 × 4P 21 1XXX	X	
OC-PZIERSW SW HAM	M.	X	
00-1500-1 SW MAN	5-12-08 X 4P 21 2X XXX	X	
		_	
(tu):	Signature:	18	Cooler (Y) N Samples Iced (Y) N
y.	Time: Received by:	5. 12.09 15:00	Temp @ receipt: ールス 。C
Relinquished by:	A Time: Received by: J	Jate: Time: 13/09 6985	Preservation/pH checked
,	TestAmerica-Westfielo		By: (F) Date: 5/1/3/09

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White = Lab file Yellow = Report copy Pink = Customer copy STL-8245 (1000)

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Minis (21 conds 2 / 26/2 St. Review/Date Chins (21 conds 2 / 26/2 Each Project # 210 2000 Console

Sulfat 7347 chericle ammonia Specific Conductance Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

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  -   -
1.0 Laboratory Deliveral

ig <sup>t</sup>						1		repancy on the	
Comments:	Laboratory			Comments:			Comments:	<ul> <li>Narrative includes an explanation of each discrepancy on the Certification Statement.</li> </ul>	
N/A	n – Field and	(papua		N/A [_]			N/A [_]	es an explan ment.	
ONI	Sample identification – Field and Laboratory	(IDs must be cross-referenced)		No[]	nat?		Ves[∫] No[∐	7 Narrative includes an Certification Statement.	
xes 📈	Sample	(IDs must b		Yes [ ] No [ ]	required for	format.	Yes [ ]		
in the laboratory report?	# Phone #	☑ Client Contact	formation.		port Certification in the	ertification with correct		project and method QA/QC performance.	
le following provided	D/ Project ID	☐ Address	nissing or illegible information.	Statement	ıpleted Analytical Re <sub>l</sub>	sing certification or c			
on: Was all of th	☑ /Address	☑ Name	submission of n	t Certification S	ort include a con	ıbmission of mis	larrative:	n exception repon	
1.1 Laboratory Information: Was all of the following provided in the laboratory report: Yes   1 NO   Check items received.	以 Name of Laboratory	Client Information:	ACTION: If no, contact lab for submission of missing	1.2 Laboratory Report Certification Statement	Does the laboratory report include a completed Analytical Report Certification in the required format?	ACTION: If no, contact lab for submission of missing certification or certification with correct format.	1.3 Laboratory Case Narrative:	☑ Narrative serves as an exception report for the	

ACTION: If no, contact lab for submission of missing or illegible information.

Comments: N/A No Yes [ 7 1.4 Chain of Custody (COC) copy present with all documentation completed?

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

## WET CHEMISTRY PARAMETERS BY VARIOUS METHODS STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

	Yes [ ] No [ ]	N/A	Comments:	
Z Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply). Container type noted  Condition observed  Ph verified (where applicable)  Field and lab IDs cross referenced	n the same day as collect Ss cross referenced	tion, temperatu	re requirement	does not apply).
ACTION: If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were the correct bottles and preservatives used?				
Ammonia,— 1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C	Yes 🔼 No 🗌	N/A	Comments:	
Oil & Grease – 1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C Alkalinity – 1 Liter polyethylene/cool to 4°C				
Chemical Oxygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C				
√ Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C				
Nitrate/nitrite - H2SO4 to pH<2, cool to 4°C				
Organic Carbon – 500 mL amber glass bottle/HCl or $\rm H_2SO_4$ to pH<2,cool to 4°C				
Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				
Phenolics - H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C				
$_{/}$ Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C				
ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment				
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes [ No [	N/A	Comments:	

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Comments:

N/A

Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special Yes [ ] No [ ]

1.5.3

## WET CHEMISTRY PARAMETERS BY VARIOUS METHODS STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

1.6 Sample Results Section report for each sample?	1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?	formation supplied in the la	iboratory Yes [ No []	N/A [ ] Comments:	
Field ID and Lab ID  Clean-up method  Matrix	国 Date and time collected 日Analysis method 日 Target analytes and concentrations	E Analyst Initials E Preparation method ions	☐ Dilution Factor ☐ % moisture or solids ☐ Reporti ☐ Date of preparation/extraction/digestion clean-up and analysis, where applicable ☐ Units (soils must be reported in dry weight)	ingestion clean-up and analysistive weight)	Is Reporting limitsis, where applicable
CTION: If no, contact lab fc	ACTION: If no, contact lab for submission of missing or incomplete information.	aplete information.	•		
1.7 QA/QC Informati for each sample batch?	1.7 QA/QC Information: Was the following information provided in the laboratory report Yes [2] for each sample batch?	tion provided in the laborator	ry report Yes [ No [	N/A [] Comments:	
☐ Method blank results □	TLCS recoveries  MS/MSD re	国 MS/MSD recoveries and RPDs 回忆都	A Laboratory duplicate results (where applicable)	plicable)	
CTION: If no, contact lab fo	ACTION: If no, contact lab for submission of missing or incomplete information.	plete information.			
2.0 Holding Times			Yes	No [ 1 N/A ] Comments:	æ **

Nitrate nitrogen as N = 48 hrs 18 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows: pH = analyze immediately Sulfide, TDS, TSS = 7 days Alkalinity = 14 days

 $\sqrt{Nitrite nitrogen as N} = 48 \text{ hrs}$ 

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

Laboratory Method

No [ ] N/A [ ] Comments: Yes 🗾

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Are the practical quantitation limits the same as those specified by the Yes [] No [] N/A [] Comments:	DEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, eria will default to values stipulated in the QAPP*. Where the QAPP does not QA/QC requirements default to limits employed by the lab**. Other criteria	Ammonia* $\square = 0.1 \text{ mg/L}$ Alkalinity** $\square = 1 \text{ mg/L}$ Bicarbonate Alkalinity** $\square = 1 \text{ mg/L}$ Carbonate Alkalinity** $\square = 1 \text{ mg/L}$	Nitrate Nitrogen as $N^* \square = .05 \text{ mg/L}$ Nitrite Nitrogen as $N^* \square = .01 \text{ mg/L}$ Chloride* $\square = 1 \text{ mg/L}$ Hardness * $\square = 2 \text{ mg/L}$	Spec. Cond.** $\square$ 3 umhos/cm Total Organic Carbon** $\square = 1 \text{ mg/L}$ Oil & Grease* $\square = 5.5 \text{ mg/L}$ Sulfate (EPA 300.0)* $\square$ = 2 mg/L	$D:* Low - 20 mg/L$ $COD* High - 50 mg/L$ $TDS* \square = 10 mg/L$ $TSS* \square = 5 mg/L$	* $\square$ < 2 to > 12 Phenolic - 0.01 mg/L	her parameter(list)	her parameter(list) PQL = \text{Source of PQL} =	ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.	3.3 Are the appropriate parameter results present for each sample in the SDG?  Yes [-] N/A [_] Comments:	ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data	3.4 If dilutions were required, were dilution factors reported?	ACTION: If no, contact the lab for submission.	Yes [ No [ ] N/A [ ] Comments:	4.1 Are the Method Blank Summaries present?  ACTION: If no, call the laboratory for submission of missing data.	4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of	11111
3.2 Are the pr □ QAPP/IR	Note: The MADEF therefore all criteria define criteria, QA/may also apply.	Ammonia* $\square = 0.1$	Nitrate Nitrogen as	Spec. Cond. ** 🖂	COD:* Low-20	pH* □ <2 to > 12	Other parameter(list)	Other parameter(list)	ACTION: If no, evaluate ch	3.3 Are the appropr	ACTION: If no, check Requ	3.4 If dilutions were	ACTION: If no, contact the	4.0 Method Blanks	4.1 Are the Method ACTION: If no, call the lab	4.2 Was a method	1 /

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## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS OLIN-WILMINGTON

ACTION: If n	ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed	r chemist fo	r action neec	led.			
4.3 Is	4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).	Yes [	] ºN	N/A	Comments:		
4.4 Dc accord If the s PQL o	4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:  If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.	Yes	No [	N/A [ ]	Comments:		
If the s	If the sample concentration is $> 5 \times \text{blank}$ value, no qualification is needed.						
ACTION: If a qualifiers.	ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.	ging level =	= 5 × blank v	alue) on the c	hecklist. List all affected	samples and their	
5.0 <u>Labor</u>	Laboratory Control Standards						
5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes I	No.	N/A[_]	Comments:	Se	
ACTION: If I judgment to det	ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.	,					
5.2	Is a LCS Summary Form present?	Yes	] %	N/A	Comments:		
ACTION: If n	ACTION: If no, contact lab for resubmission of missing data.						
5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes	No [2]	N/A	Comments:		

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

LCS Limits:			
Alkalinity** $\square = 80-120\%$ Total Organic Carbon** $\square = 80-120\%$ COD Low* $\square = 80-120\%$ Hardness* $\square = 80-120\%$	Bicarbonate Alkalinity** $\square = 80-120\%$ 7DS** $\square = 80-120\%$ COD High* $\square = 80-120\%$ Chloride* $\square = 80-120\%$	Carbonate Alkalinity** $\square = 80-120\%$ Oil & Grease* $\square = 80-120\%$ Nitrate Nitrogen as N** $\square = 80-120\%$ Sulfate (EPA 300.0)* $\square = 80-120\%$	Specific Conductivity * $\square$ = 80-120% Annuonia Nitrogen as N* $\square$ = 80-120% Nitrite Nitrogen as N** $\square$ = 80-120% pH* $\square$ = 98-102%
Other parameter(list)	%R =	Rec Limits=	
Other parameter(list)	%R =	□ Rec Limits =	
	(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	ry limits for wet chemistry analyses.)	
ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R)	ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).	atch as (J). If recovery is below the lower li	mit, qualify all positive and no-detect results
6.0 Matrix Spikes			
Matrix spikes may be collected at different frequencies based on monthly, quarterly, specific schedules. Confirm spike requirements for each set with the senior chemist.	Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.	r task	
6.1 Were project-specific MS/MSDs analyzed? List project ACTION: If no, contact senior chemist to see if any were specified.  6.2 Is the MS/MSD Recovery Form present?  ACTION: If no, contact lab for resubmission of missing data.	Ds analyzed? List project samples that were spiked. f any were specified. orm present? of missing data.		Yes [] No [] N/A [] Comments: The lab performed nitrate, nitrite, so I toke, and ellow, it messed on scaple of Rest.  Yes [] No [] N/A [] Comments:
6.3 Were matrix spikes analyze matrix?	Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?	es per Yes [ Mo [ ] N/A [ ]	Comments:
ACTION: If any matrix spike data is missing, call lab for resubmission.  6.4 Are any wet chemistry analyte spike recoveries outside	call lab for resubmission.  te spike recoveries outside of the QC limits?	Yes   Not NAF	Comments:

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

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NOTE: %R = SA	(SSR-SR) x 100%	Where:	SSR = Spiked sample resu SR = Sample resu
	SA = Spike added		
MS/MSD Recovery Limits:			
Alkalinity* = $NA$	Bicarbonate Alkalinity* = $NA$	Carbonate alkalinity* = $NA$	Ammonia* (LACHAT) DE 75-125%
Chloride*(SM 4500 CI) 12=75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* $\Box = 75-125\%$	COD High* $\Box = 75-125\%$	Nitrate Nitrogen as N** 🗗 = 75-125%
Nitrite Nitrogen as N** 🖂 75-125%	Hardness* $\Box = 75-125\%$	Sulfate (EPA 300.0)* $\Box = 75-125\%$ pH* = NA	$pH^* = NA$ TSS* = NA
Other parameter(list)	%R =	Rec Limits =	= 53
* = Laboratory Limits **	** = Olin QAPP Limits (MADEP has $n$	(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	ret chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required. ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? NOTE: RPD =  $\frac{S - D}{(S + D)/2}$  x 100% Where S = MS result  $\frac{(S + D)/2}{(S + D)/2}$ 

Yes No Mo NA Comments:

## MS/MSD RPD Limits:

RPD <20

## 7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes No NA COmmen

## OLIN-WILMINGTON

LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS	
ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).	
pH* $\square = 3\%$ Specific Conductivity * $\square = 5\%$ TSS** $\square = 6\%$ TDS** $\square = 6\%$	
8.0 Sampling Accuracy	
The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.	
8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the Yes [ ] No [ MA [ ] Comments: associated samples from the senior chemist.	
8.2 Do any rinsate blanks have positive results?  Yes [ ] No [ ] N/A [ Comments:	
ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.	below.
If the sample concentration is $> 5 \times \text{blank}$ value, no qualification is needed.	
NOTE: MADEP does not require the collection of rinsate blanks.	
9.0 Field Duplicates	
9.1 Were field duplicate samples collected? Obtain a list of samples and their associated Yes [ ] No [ J NA [ ] Comments: field duplicates.	
9.2 Were field duplicates collected per the required frequency?	
QAPP/IRSWP   MADEP Option 1(1 per 20)   MADEP Option 3 (1 per 10)	
9.3 Was the RPD $\leq$ 30% for waters $\leq$ 50% for soils? Calculate the RPD for results and Yes $\lfloor \cdot \rfloor$ No $\lfloor \cdot \rfloor$ No $\lfloor \cdot \rfloor$ Comments: attach to this review.	

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

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of the data q	
Was any	

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

## REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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## Version 1.2, Nov 2002

## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

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Reviewer/Date	Sr. Review/L	Lab Repor	Project #

aluminum, chromium, sodium, total and dissolved

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1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes 🗹 No 📋 N/A 📋 Check items received.	es 🗹 No N/A Comments:
☑ Name of Laboratory	Sample identification – Field and Laboratory   (IDs must be cross-referenced)
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement	Yes [ No [ V ] N/A [ ] Comments:
Does the laboratory report include a completed Analytical Report Certification in the required format?	mat?
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	nat.
1.3 Laboratory Case Narrative:	Yes [ \( \sum \) No [ \] N/A [ \] Comments:
${\it \square}$ Narrative serves as an exception report for the project and method QA/QC performance. on the	rance.   ☐ Narrative includes an explanation of each discrepancy
	Certification Statement.

Comments:

Yes [ No [ ] N/A [ ]

1.4 Chain of Custody (COC) copy present with all documentation completed

ACTION: If no, contact lab for submission of copy of completed COC.

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of missing or illegible information.

## LEVEL I DATA QUALITY EVALUATION – OPTION 1 TANDARD OPERATING PROCEDURE AND CHECKLIST

STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7	sent?):  Yes [ No [ ] N/A [ ] Comments: receipt of the sample(s)	delivered on the same day as collection, temperature requirement does not apply).  Field and lab IDs cross referenced		Yes [ No [ ] N/A [ ] Comments:	indicate other problems tical problems or special Yes [ ] No [ ] N/A [ ] Comments:	d in the Yes [ ] No [ ] N/A [ ] Comments:	Dilution Factor
STANDARD OPERA	1.5 Sample Receipt Information (Cooler Receipt Form present?):  Were each of the following tasks completed and recorded upon receipt into the laboratory?	Sample temperature confirmed: must be 1° − 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).  Gontainer type noted □ sample condition observed ☐ pH verified (where applicable) □ Field and lab IDs cross referenced	ACTION: If no, contact lab for submission of missing or incomplete documentation.	1.5.1 Were all samples delivered to the laboratory without breakage?	1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?	E Field ID and Lab ID

Comments:

No [] N/A[]

1.7 QA/QC Information: Was each of the following information supplied in the Yes /

ACTION: If no, contact lab for submission of missing or incomplete information.

Method blank results	回LCS recoveries	Laboratory duplicate results (where applicable)
ACTION: If no	ACTION: If no, contact lab for submission of missing or incomplete information.	
2.0 Holdin	Holding Times	
Have any techn exceed	Have any technical holding times, determined from date of collection to date of analysis, been 'x exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil.	Yes No M N/A Comments:
NOTE: List san	NOTE: List samples that exceed hold time with # of days exceeded on checklist	
ACTION: If te (UJ). I	ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.	
3.0 <u>Labor</u>	Laboratory Method	
3.1	Was the correct laboratory method used?	Yes [ No [ ] N/A [ ] Comments:
	Water Digestion 3005A or 3010A or 3020A Soil Digestion 3050B Metals 6010B or 200.7	
ACTION: If no, con compared to the reques and to request variance.	ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.	
3.2	Are the practical quantitation limits the same as those specified by the NOW ZOAPP	Yes V No NA Comments:
NOTE: Verify	NOTE: Verify that the reported metals match the target list specified on the COC.	

		Yes [ ] No [ ] N/A [ ] Comments:	ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data	Yes \[ \mathbb{M}  \text{No} \bigcup \text{N/A} \bigcup \text{Comments:}			Yes [ ] No [ ] N/A [ ] Comments:		Yes [ No [ ] N/A [ ] Comments:		\	Yes No N/A Comments:	Yes [w] No [] N/A [] Comments:  4.3 vectoral with the observable sungles  OC-102 words in the the observable sungles  The vericle the chamman observable in synch
ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution,	moisture, etc. If sample PQL is indeterminate, contact lab for explanation.	3.3 Are results present for each sample in the SDG?	ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it	3.4 If dilutions were required, were dilution factors reported?	ACTION: If no, contact the lab for submission.	4.0 Method Blanks	4.1 Is the Method Blank Summary present?	ACTION: If no, call the laboratory for submission of missing data.	4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.	4.3 Is the method blank less than the PQLs for all target elements?	NOTE: MADEP requires the method blank to be matrix matched and digested with the samples	4.4 Do any method blanks have positive results for metals? Qualify data according to y the following: Aluminum (3.6 mg/k) is reported in the nuffer bluck of 0.0-75:0-3, 0.0-75:0-2, 0.0-02 le kessus, 0.0-92:0 Results in the number of 18.0 mg/k).  6010.doc Anathin kind with a stablized of 5x the bluck one. (1871/x).  CC-75:0-2 is less than the action limit afternoon

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times \text{blank}$  value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

ndord	maar a	
Control Otto	COULT OF STA	
Lohomotowa	Laboratory	
4	0.0	

standard run with each analytical batch of 20 Yes [ No [ ] N/A [ ] Comments:	NOTE: A <u>full</u> target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.	Yes [ No [ ] N/A [ ] Comments:	f missing data.	Is the recovery of any analyte outside of MADEP control limits?  Yes No No NA COmments:		
Was a laboratory control standa samples or less?	NOTE: A <u>full</u> target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not av professional judgement to evaluate data accuracy associated with that batch.	Is a LCS Summary Form present?	ACTION: If no, contact lab for resubmission of missing data.	e recovery of any analyte out	% Rec 80-120	
5.1 Was samp	OTE: A <i>full</i> target CTION: Call la rofessional judgen	5.2 Isal	CTION: If no, co	5.3 Is the	Sample Type Water	

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is <30%, positive and nondetect results are rejected (R). Comments:

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## STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION - OPTION 1 ICP METALS BY METHOD 6010B/200.7 OLIN CORPORATION

## Matrix Spikes 0.9

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Comments:
N/A [
No [Z
Yes [
List project samples that were
Were project-specific MS/MSDs collected? spiked.
6.1

ACTION: If no, contact senior chemist to see if any were specified.

Were matrix spikes analyzed as indicated on the COC and project Yes \( \) No \( \) N/A \( \lambda \) ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no schedule? 6.3

qualification is needed. Narrate non-compliance.

Comments:

Comments:

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

Yes No NA Y Comments:	result	
ecoveries outside of the QC limits?	Where: $S = MS$ sample 1	D = MSD sample result
Are any RPDs for MS/MSD re-	E: RPD = S-D x 100%	(S+D)/2
6.5	∰ ⊠	

NOTE:

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects

## 7.0 Laboratory Duplicate

Comments: 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ No [ NA [ ] Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes No NA Comments:

## STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION - OPTION 1 ICP METALS BY METHOD 6010B/200.7 **OLIN CORPORATION**

OAPP RPD	20	20	20	20
MADEP Laboratory Duplicate Sample RPD Criteria:	For aqueous results > $5x$ RL, RPD must be $\pm 20\%$	For aqueous results < $5x$ RL, RPD must be $\leq$ RL	For soil/sediment results > $5x$ RL, RPD must be $\pm 35\%$	For soil/sediment results < $5x$ RL, RPD must be $\leq 2x$ RL

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

## Sampling Accuracy 8.0

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

or to evaluating rinsate blanks, obtain a list of ist.	No L		Comments:
60	lected? Prior to evaluating rinsate blanks, obtain a list of senior chemist.	or to evaluating rinsate blanks, obtain a list of ist.	or to evaluating rinsate blanks, obtain a list of Yes No No N/A Sist.  Ver results?

ACTION: Evaluate rinsate results against blank results to determine if contaminant NOTE: MADEP does not require the collection of rinsate blanks.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL. may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $> 5 \times \text{blank}$  value, no qualification is needed.

## Field Duplicates 9.0

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated Yes [ No [ ] field duplicates.

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## LEVEL I DATA OHALITY EVALHATION - OPTION 1 **OLIN CORPORATION**

ži S			- 21	24			Pt 16 RRSW, OC-TSEO-1 are consultable
STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7	9.2 Were field duplicates collected per the required frequency?  Yes No NA [1]	SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and Yes $\square$ No $\square$ N/A $\square$ Comments: attach to this review.	ACTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.	Special OA/OC	10.1 Were both total and dissolved metals analysis performed? If so, the Yes [ No [ ] N/A [ ] Comments: dissolved metal concentration should not exceed that of the total metal.	ACTION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)
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Comments:

No [ ] N/A [ ]

Yes [

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

## REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989. U.S. Environmental Protection Agency (USEPA), 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.



### **ANALYTICAL REPORT**

## **FILE COPY**

Job Number: 360-22595-1

Job Description: Slurry Wall / Cap

For:

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

OF PARAMETERS ORDERED BY

Joseph a. Cheur J.

Approved for release.
Joe Chimi
Report Production Representative
5/29/09 10:49 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
05/29/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002



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Project Loca	Name:	ame: TestAmerica Westfield			Proj	ect #:	360-22595-1		
TOJECI LOG	ation:	Slurry Wall /	′ Сар		MADEP F	RTN¹:			
This form pr	rovides certific	ations for the fo	ollowing data se	t:[list Laborator	/ Sample ID Nun	nber(s)]			
860-22595-	(1-3)								
Sample Mat	trices:	Groundwater		ediment	Drinking Wate				
MCP SW-8		8260B( )	8151A ( )	8330 ( )	6010B (x)	7470A/1A (		Othe	r ( )
Methods l		8270C( )	8081A ( )	VPH()	6020 ( )	9014M <sup>2</sup> /90	` '		
As specified Compendiu	l in MADEP	8082 ( )	8021B ( ) Tracking Numl	EPH()	7000 S <sup>3</sup> ( )	7196A ( )			
Analytical M			•	, ,	own iologically Availa	ble Cvanid	e (PAC	) Metho	d
check all th				•	vidual method ar	-	- (	,	
An affir	mative respo	nse to questio	ns A, B, C and	D is required	or "Presumptiv	e Certaint	y" statı	ıs	
Α	Were all samp	oles received by	the laboratory i	n a condition co	onsistent with		Yes		No <sup>1</sup>
	•	•	f-Custody docu				1		-
,	Were all OA/C	C procedures i	required for the	specified analy	ical method(s)		Yes		No <sup>1</sup>
		•	d, including the		, ,		√		. 10
		•	a that did not me	-					
:	standards or g	juidelines?							
	Does the analy	vtical data inclu	ded in this repor	t meet all the r	equirements		Yes	N/A	No <sup>1</sup>
	-	•	•		(b), (c) and (d) o	;	$\sqrt{}$		
1	the MADEP do	ocument CAM \	/II A, " Quality A	ssurance and (	Quality				
(	Control Guidel	lines for the Acc	quisition and Re	porting of Analy	rtical Data"?				
,	VPH and EPH	I methods only	: Was the VPH	or EPH Metho	d conducted with	out	Yes	N/A	No <sup>1</sup>
D s	significant mod	difications (see	Section 11.3 of	respective Met	hods)?			$\checkmark$	
	A respons	se to question	s E and F belov	v is required for	or "Presumptive	Certainty	" statu	s	
E	Were all QC p	erformance sta	ndards and reco	mmendations	for the		Yes		No <sup>1</sup>
:	specified meth	nods achieved?					$\sqrt{}$		
F	Were results f	or all analyte-lis	st compounds/el	ements for the	specified		Yes	N/A	No <sup>1</sup>
ŀ	method(s) rep	orted?							
1	All Negative r	esponses must	be addressed i	n an attached E	nvironmental La	boratory ca	ase nar	rative.	
. the under	_	<del>-</del>	-		hat, based upo		onal		
	-		_		erial contained i				
nquiry of t	eport is, to th	ie best of my k	nowledge and	belief, accura	te and complete				
nquiry of t					<b>.</b>		ъ.	otor.	
nquiry of t analytical r		6-	$\gamma/$		Position.	I aborato	rv I )ire	CHOI	
nquiry of t analytical r	Signature:	St	Harton		Position:	Laborato	ry Dire	Cloi	
nquiry of t	Signature:	Steven C. Ha	<b>Fastur</b> artmann	<b></b>	Position:Date:		ry Dire 5/29/09		
nquiry of t analytical r	Signature:	Steven C. Ha	Hertung artmann		_ Date:			10:39	pril-04
nquiry of tanalytical r	Signature: rinted Name:	ally signed and approved.  MADEP MA014	Artmann  NELAP FL E87912 TOX		_ Date:			10:39	pril-04
nquiry of t analytical r	Signature: rinted Name:	ally signed and approved.		2	_ Date:			10:39	pril-04

Laborator	y Name:	ame: TestAmerica Westfield			Proj	ject #:	360-22595-1		
Project Lo	cation:	Slurry Wall	/ Cap		MADEP	RTN <sup>1</sup> :			
This form	provides certific	cations for the f	ollowing data set	:[list Laboratory	Sample ID Nur	mber(s)]			
360-2259	5-(1-3)								
Sample M		Groundwate		ediment	Drinking Wate				
MCP SW		8260B( )	8151A ( )	8330 ( )	6010B ( )	7470A/1A		Other	( <b>x</b> )
Methods		8270C( ) 8082 ( )	8081A ( ) 8021B ( )	VPH() EPH()	6020 () 7000 S <sup>3</sup> ()	9014M <sup>2</sup> /9 7196A (	. ,		
as specili Compend	ed in MADEP ium of	` ,	e Tracking Numb	. ,	` /	7 130A (	'		
•	Methods.		6 Method 9014 o	, ,		able Cyanic	le (PAC	) Metho	d
check all	that apply)	3 S - SW-846	Methods 7000 S	Series List indi	vidual method a	nd analyte.			
An aff	irmative respo	nse to question	ons A, B, C and	D is required f	or "Presumptiv	e Certain	y" stat	us	
Α	Were all samp	oles received by	y the laboratory ir	n a condition co	nsistent with		Yes		No <sup>1</sup>
	that described	on the Chain-d	of-Custody docur	nentation for th	e data set?				
	Were all QA/0	QC procedures	required for the s	pecified analyt	ical method(s)		Yes		No <sup>1</sup>
В	included in thi	s report followe	d, including the r	equirement to	note and		$\sqrt{}$		
			a that did not me	et appropriate	performance				
	standards or (	guidelines?							
	Does the anal	ytical data inclu	ided in this repor	t meet all the re	equirements		Yes	N/A	No <sup>1</sup>
С		•	as described in S	` '		of		$\sqrt{}$	
			VII A, " Quality As		•				
			quisition and Rep						
_		,	y: Was the VPH			nout	Yes	N/A	No <sup>1</sup>
D	significant mo	difications (see	Section 11.3 of	respective Met	nods)?			٧	
	A respon	se to question	s E and F below	is required fo	or "Presumptive	e Certainty	/" statu	s	
E	Were all QC p	erformance sta	andards and reco	mmendations	or the		Yes		No <sup>1</sup>
	specified met	hods achieved?	)				V		
F	Were results	for all analyte-li	st compounds/ele	ements for the	specified		Yes	N/A	No <sup>1</sup>
	method(s) rep	orted?						$\sqrt{}$	
	<sup>1</sup> All Negative	rooponooo muo	t be addressed ir	on attached F	invironmental L	aborotory o	000 nor	rotivo	
the und			ains and penalti					ialive.	
	_	-	ning the informa		- ·		Oriai		
	-		knowledge and						
-					-				
	Signature:	St	Vartur		Position	Laborato	ry Dire	ctor	
	Printed Name:	: Steven C. H	artmann		Date	:	5/29/09	9 10:39	
he certification	form has been electronic				CAM VII	A, Rev 3.2		A	pril-04
		MADEP MA014	NELAP FL E87912 TOX		TestAmerica Westfield	 t			
<b>TestA</b>	merica	NY DOH 10843	NELAP NJ MA008 TOX		53 Southampton Rd,				
		RI DOH 57	NELAP NY 10843	N ACCOA.	Westfield, MA 01085				
THE LEADER IN	ENVIRONMENTAL TESTING	CT DPH 0494	NH DES 253901-A	1	Tel:(413)572-4000				

### **CASE NARRATIVE**

**Client: Olin Corporation** 

Project: Slurry Wall / Cap

Report Number: 360-22595-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/13/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.4°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

### **DISSOLVED METALS**

Samples 360-22595-1 through 360-22595-3 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/18/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

### General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

### **ANIONS**

Samples 360-22595-1 through 360-22595-3 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/14/2009 and 05/15/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22595-1(10X), 360-22595-2(20X) and 360-22595-3(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

### **AMMONIA**

Samples 360-22595-1 through 360-22595-3 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/22/2009 and 05/28/2009.

All QC performance standards and recommendations for this specific method were achieved.

Sample 360-22595-2(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilution was due to high concentration.

### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22595-1 through 360-22595-3 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/18/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation Job Number: 360-22595-1

Lab Sample ID C	lient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22595-1	OC-GW-42S				
Sulfate		8.0	2.0	mg/L	300.0
Chloride		67	10	mg/L	300.0
Ammonia		0.37	0.10	mg/L	L107-06-1B
Specific Conductance		310	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		510	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
360-22595-2	OC-GW-201S				
Sulfate		1300	40	mg/L	300.0
Chloride		24	1.0	mg/L	300.0
Ammonia		72	1.0	mg/L	L107-06-1B
Specific Conductance		2500	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		14	5.0	ug/L	6010B
360-22595-3	OC-GW-35S				
Sulfate		400	20	mg/L	300.0
Chloride		6.6	1.0	mg/L	300.0
Ammonia		19	0.10	mg/L	L107-06-1B
Specific Conductance		1000	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		25 J	100	ug/L	6010B
Chromium		16	5.0	ug/L	6010B
C 51111G111			0.0	~9, <b>-</b>	55.55

### **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-22595-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals Sample Filtration, Field	TAL WFD TAL WFD	SW846 6010B FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia Distillation, Ammonia	TAL WFD TAL WFD	LACHAT L107-06-1B Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

### Lab References:

TAL WFD = TestAmerica Westfield

### **Method References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### METHOD / ANALYST SUMMARY

Client: Olin Corporation Job Number: 360-22595-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

### **SAMPLE SUMMARY**

Client: Olin Corporation Job Number: 360-22595-1

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-22595-1	OC-GW-42S	Water	05/11/2009 1515	05/13/2009 0930
360-22595-2	OC-GW-201S	Water	05/12/2009 0950	05/13/2009 0930
360-22595-3	OC-GW-35S	Water	05/12/2009 1150	05/13/2009 0930

# **SAMPLE RESULTS**

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

360-22595-1

Lab Sample ID:

Client Sample ID: OC-GW-42S Date Sampled: 05/11/2009 1515

Date Received: 05/13/2009 0930 Client Matrix: Water

Analyte Result/Qualifier Unit MDL RLDilution 05/18/2009 1152 Method: Dissolved-6010B Date Analyzed: Aluminum 510 ug/L 2.2 100 1.0 Chromium 12 ug/L 0.17 5.0 1.0

Mr. Steven Morrow

Job Number: 360-22595-1

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-42S Lab Sample ID: 360-22595-1 Date Sampled: 05/11/2009 1515 Date Received: 05/13/2009 0930

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	05/14/2009 2053	
Sulfate	8.0	mg/L	2.0	2.0	1.0
Method: 300.0		Date Anal	yzed:	05/14/2009 2108	
Chloride	67	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed:	05/22/2009 1349	
Prep Method: Distill/Ammonia		Date Prep	ared:	05/22/2009 0850	
Ammonia	0.37	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	05/18/2009 1105	
Specific Conductance	310	umhos/cm	1.0	1.0	1.0

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-201S
 Date Sampled:
 05/12/2009 0950

 Lab Sample ID:
 360-22595-2
 Date Received:
 05/13/2009 0930

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 05/18	3/2009 1210	
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	14	ug/L	0.17	5.0	1.0

3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-201S
 Date Sampled:
 05/12/2009 0950

 Lab Sample ID:
 360-22595-2
 Date Received:
 05/13/2009 0930

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	05/14/2009 2223	
Chloride	24	mg/L	1.0	1.0	1.0
Method: 300.0		Date Anal	yzed:	05/15/2009 1942	
Sulfate	1300	mg/L	40	40	20
Method: L107-06-1B		Date Anal	yzed:	05/22/2009 1408	
Prep Method: Distill/Ammonia		Date Prep	ared:	05/22/2009 0850	
Ammonia	72	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	05/18/2009 1108	
Specific Conductance	2500	umhos/cm	1.0	1.0	1.0

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-35S
 Date Sampled:
 05/12/2009 1150

 Lab Sample ID:
 360-22595-3
 Date Received:
 05/13/2009 0930

Analyte	Result/Qua	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	nalyzed: 05/18	3/2009 1213	
Aluminum	25	J	ug/L	2.2	100	1.0
Chromium	16		ug/L	0.17	5.0	1.0

Mr. Steven Morrow

Job Number: 360-22595-1

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-35S
 Date Sampled:
 05/12/2009 1150

 Lab Sample ID:
 360-22595-3
 Date Received:
 05/13/2009 0930

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	05/14/2009 2324	
Chloride	6.6	mg/L	1.0	1.0	1.0
Method: 300.0		Date Anal	yzed:	05/14/2009 2339	
Sulfate	400	mg/L	20	20	10
Method: L107-06-1B		Date Anal	yzed:	05/28/2009 1413	
Prep Method: Distill/Ammonia		Date Prep	ared:	05/28/2009 1110	
Ammonia	19	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	05/18/2009 1109	
Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

### **DATA REPORTING QUALIFIERS**

Client: Olin Corporation Job Number: 360-22595-1

Lab Section	Qualifier	Description	
NA C.I.			
Metals			
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	

# **QUALITY CONTROL RESULTS**

Client: Olin Corporation Job Number: 360-22595-1

### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					•
Analysis Batch:360-4455	53				
_CS 360-44553/13	Lab Control Sample	Т	Water	6010B	
LCSD 360-44553/25	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-44553/14	Method Blank	Т	Water	6010B	
360-22595-1	OC-GW-42S	D	Water	6010B	
360-22595-1DU	Duplicate	D	Water	6010B	
360-22595-1MS	Matrix Spike	D	Water	6010B	
360-22595-2	OC-GW-201S	D	Water	6010B	
360-22595-3	OC-GW-35S	D	Water	6010B	

### Report Basis

D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-22595-1

### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-4453	34				
_CS 360-44534/2	Lab Control Sample	Т	Water	300.0	
MB 360-44534/1	Method Blank	Т	Water	300.0	
360-22595-1	OC-GW-42S	Т	Water	300.0	
Analysis Batch:360-4453	35				
CS 360-44535/2	Lab Control Sample	Т	Water	300.0	
MB 360-44535/1	Method Blank	Т	Water	300.0	
360-22595-2	OC-GW-201S	Т	Water	300.0	
360-22595-2MS	Matrix Spike	Т	Water	300.0	
360-22595-2MSD	Matrix Spike Duplicate	Т	Water	300.0	
360-22595-3	OC-GW-35S	Т	Water	300.0	
Analysis Batch:360-4453	37				
_CS 360-44537/2	Lab Control Sample	Т	Water	300.0	
MB 360-44537/1	Method Blank	Т	Water	300.0	
360-22595-2	OC-GW-201S	Т	Water	300.0	
Analysis Batch:360-4454	48				
_CS 360-44548/1	Lab Control Sample	T	Water	SM 2510B	
MB 360-44548/2	Method Blank	Т	Water	SM 2510B	
360-22595-1	OC-GW-42S	Т	Water	SM 2510B	
360-22595-1DU	Duplicate	Т	Water	SM 2510B	
360-22595-2	OC-GW-201S	Т	Water	SM 2510B	
360-22595-3	OC-GW-35S	T	Water	SM 2510B	
Prep Batch: 360-44728					
_CS 360-44728/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-44728/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-22595-1	OC-GW-42S	Т	Water	Distill/Ammonia	
360-22595-2	OC-GW-201S	T	Water	Distill/Ammonia	
Analysis Batch:360-4474	44				
_CS 360-44728/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-44728
MB 360-44728/1-A	Method Blank	Т	Water	L107-06-1B	360-44728
360-22595-1	OC-GW-42S	Т	Water	L107-06-1B	360-44728
360-22595-2	OC-GW-201S	Т	Water	L107-06-1B	360-44728
Prep Batch: 360-44909					
_CS 360-44909/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-44909/1-A	Method Blank	Т	Water	Distill/Ammonia	

Client: Olin Corporation Job Number: 360-22595-1

### **QC Association Summary**

Report Basis Lab Sample ID Client Sample ID **Client Matrix** Method Prep Batch **General Chemistry** Analysis Batch:360-44916 LCS 360-44909/2-A Т L107-06-1B 360-44909 Lab Control Sample Water Water MB 360-44909/1-A Т 360-44909 Method Blank L107-06-1B Т 360-22595-3 OC-GW-35S Water L107-06-1B 360-44909

### Report Basis

T = Total

Initial Weight/Volume:

20

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44553 Method: 6010B Preparation: N/A

Dilution:

Chromium

1.0

Analysis Batch: 360-44553 Lab Sample ID: MB 360-44553/14 Instrument ID: Varian 720 ES ICP Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Units: ug/L 05/18/2009 1054 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

RL Analyte Result Qual MDL ND 2.2 100 Aluminum Chromium ND 0.17 5.0

Lab Control Sample/ Method: 6010B Lab Control Sample Duplicate Recovery Report - Batch: 360-44553 Preparation: N/A

LCS Lab Sample ID: LCS 360-44553/13 Analysis Batch: 360-44553 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 05/18/2009 1051 Final Weight/Volume: Date Analyzed: 10 mL

Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-44553/25 Analysis Batch: 360-44553 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: ug/L 1.0 Initial Weight/Volume: 05/18/2009 1155 Date Analyzed: Final Weight/Volume: 10 mL

Date Prepared: N/A

99

100

% Rec. LCS Limit RPD RPD Limit LCS Qual LCSD Qual Analyte LCSD Aluminum 100 100 80 - 120 0 20

80 - 120

0

Client: Olin Corporation Job Number: 360-22595-1

Method: 6010B Matrix Spike - Batch: 360-44553

Preparation: N/A

Lab Sample ID: 360-22595-1 Analysis Batch: 360-44553 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Units: ug/L Initial Weight/Volume:

10 mL

N/A

05/18/2009 1204 Final Weight/Volume: Date Analyzed: Date Prepared: N/A

Limit Analyte Sample Result/Qual Spike Amount Result % Rec. Qual Aluminum 510 5000 5510 100 75 - 125 Chromium 12 1000 996 98 75 - 125

Duplicate - Batch: 360-44553 Method: 6010B Preparation: N/A

Lab Sample ID: 360-22595-1 Analysis Batch: 360-44553 Instrument ID: Varian 720 ES ICP

Client Matrix: Prep Batch: N/A Lab File ID: Water N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 05/18/2009 1201

Final Weight/Volume: Date Analyzed: 1.0 mL Date Prepared: N/A

Result Sample Result/Qual RPD Limit Qual Analyte Aluminum 510 515 0 20 Chromium 12 11.6 0 20

No Equipment Assigned

Instrument ID:

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44534 Method: 300.0 Preparation: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 05/14/2009 1520 Final Weight/Volume: 1.0 mL

Analysis Batch: 360-44534

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-44534 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44534/2 Analysis Batch: 360-44534 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 05/14/2009 1536 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

MB 360-44534/1

Lab Sample ID:

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 81.6 102 40.0 85 - 115 Chloride 40.6 102

No Equipment Assigned

Instrument ID:

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44535 Method: 300.0 Preparation: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 05/14/2009 2153 Final Weight/Volume: 1.0 mL

Analysis Batch: 360-44535

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-44535 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44535/2 Analysis Batch: 360-44535 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0

1.0 mL Date Analyzed: 05/14/2009 2208 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 81.7 102 40.0 85 - 115 Chloride 40.9 102

Calculations are performed before rounding to avoid round-off errors in calculated results.

Lab Sample ID:

MB 360-44535/1

Client: Olin Corporation Job Number: 360-22595-1

Matrix Spike/ Method: 300.0 Matrix Spike Duplicate Recovery Report - Batch: 360-44535 Preparation: N/A

MS Lab Sample ID: Analysis Batch: 360-44535 360-22595-2 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: 10 Initial Weight/Volume: 1.0 mL

05/14/2009 2254 Final Weight/Volume: Date Analyzed: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-22595-2 Analysis Batch: 360-44535 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Initial Weight/Volume: Dilution: 10 1.0 mL Date Analyzed: 05/14/2009 2309 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec.

RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Chloride 75 - 125 105 105 0 20

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44537 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-44537 MB 360-44537/1 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 05/15/2009 1811 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-44537 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44537/2 Analysis Batch: 360-44537 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 05/15/2009 1826 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 82.1 103 40.0 85 - 115 Chloride 41.0 103

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44728 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-44728/1-A Analysis Batch: 360-44744 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-44728 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/22/2009 1345 Final Weight/Volume: 50 mL

Date Analyzed: 05/22/2009 1345 Final Weight/Volume: 50 mL

Date Prepared: 05/22/2009 0850

 Analyte
 Result
 Qual
 RL
 RL

 Ammonia
 ND
 0.10
 0.10

Lab Control Sample - Batch: 360-44728 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-44728/2-A Analysis Batch: 360-44744 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-44728 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

 Date Analyzed:
 05/22/2009 1346
 Final Weight/Volume:
 50 mL

 Date Prepared:
 05/22/2009 0850
 Final Weight/Volume:
 50 mL

Analyte Spike Amount Result % Rec. Limit Qual
Ammonia 10.0 9.36 94 85 - 115

1.0 mL

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44909 Method: L107-06-1B

Preparation: Distill/Ammonia

85 - 115

Lab Sample ID: MB 360-44909/1-A Analysis Batch: 360-44916 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-44909 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume:

Date Analyzed: 05/28/2009 1408 Final Weight/Volume: 50 mL

Date Prepared: 05/28/2009 1110

 Analyte
 Result
 Qual
 RL
 RL

 Ammonia
 ND
 0.10
 0.10

Lab Control Sample - Batch: 360-44909 Method: L107-06-1B

10.0

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-44909/2-A Analysis Batch: 360-44916 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-44909 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/28/2009 1409 Final Weight/Volume: 50 mL
Date Prepared: 05/28/2009 1110

Analyte Spike Amount Result % Rec. Limit Qual

9.71

97

Ammonia

Client: Olin Corporation Job Number: 360-22595-1

Method Blank - Batch: 360-44548 Method: SM 2510B

Preparation: N/A

N/A

Lab Sample ID: MB 360-44548/2 Analysis Batch: 360-44548 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

05/18/2009 1103 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Result Qual RL RL Specific Conductance ND 1.0 1.0

Lab Control Sample - Batch: 360-44548 Method: SM 2510B

Preparation: N/A

Lab Sample ID: LCS 360-44548/1 Analysis Batch: 360-44548 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Initial Weight/Volume: Units: umhos/cm

05/18/2009 1101 Date Analyzed: Final Weight/Volume:

1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 1410 1420 101 85 - 115 Specific Conductance

Method: SM 2510B Duplicate - Batch: 360-44548

Preparation: N/A

Lab Sample ID: 360-22595-1 Analysis Batch: 360-44548 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

05/18/2009 1106 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

RPD Qual Analyte Sample Result/Qual Result Limit Specific Conductance 310 307 0 20

				State Approditatio	n	
		New York		State Accreditation	Florida	1
Method Name	Description	(NELAC)	Mass	Conn	(NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)	( - /			NP	
SM 4500 CI F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		Р			
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		Р			
SM 9222B	Coliforms, Total (Membrane Filter)		Р			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		1
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		Р	P		+
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	• • •	NP		+
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction	141		141		
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)	OVV	NP	NP		-
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW	INI	NP/SW		-
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	73 7 7	INF/SW		NP/SW		
	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		NP/SW
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	Р	P	P P		INF/SVV
524.2 524.2	Volatile Org Comp (GC/MS)(list upon request)	-	P	P		
	Trihalomethanes	NP	NP	NP		
624	Volatile Org Comp (GC/MS)(list upon request)	SW	NP .	SW		
5035	Closed System Purge and Trap	NP		NP		
5030B	Purge and Trap					
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		ND/OW/
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric	ND/D	P NP/P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	NB	SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP NB/OW	NP	NP NP/OW/		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		1
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		1
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		1
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		1
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P		

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory This listing is subject to change based on the laboratories certification standing.

### **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-22595-1

Login Number: 22595 List Source: TestAmerica Westfield

Creator: McDonald, Jerry

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.4C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica Laboratories, Inc. **Chain of Custody Form** 

THE LEADER IN ENVIRONMENTAL TESTING 360 C 33595 TestAmerica

•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

•149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/MACTEC	91000010	Job# Quote#	PO#
	er Thempse	Analysis Requested	Comments (Special Instructions)
	Work ID: Terminal Color of the	oneck analysis and specify method and analytes in comments section.	
	Cha	For example:	MCP case narrative
iund Time Risb TAT Reguested:	Regulatory Classification / Special Report Format	600-series for waste water	
_ 72 hrs	MCP GW1/S1 MWRA Smart Rpt	ovou-series for naz/solio waste Use comments section to further define.	
_ 5 Day	Other MCP QA/QC Rpt XX	,	
SW-Surfacewater	Preservative	stals	
∿Air Z-Other	Glassi Gl	er me	
91,8	on (9) on	ewa	
Sample Type Sample Initials	Time Comp. Comp. H2GO H2GO H2GO H2GO H2GO H2GO H2GO H2GO	Nitrate Ground Sedimer Other Other Other Other	
GW TAN	XXXT TT AC X SIIS	X	Dissolved metals are field filtered.
- RAF	X X X 4 4 4 4 5 X X 50 5 1 5 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6	X	Groundwater Metals: Dissolved AI/Cr
GW PLC	XXXT	X	Surfacewater Metals: Dissolved/Total
			Al/Cr/Na
Mark Mag	Signature:		Cooler of Y LN. Samples Iced of YILA
l N	Time:	Date: Time: 5・12・00	) 🦉
Date:	Time: Received by:	Date: Time: 5/3/09 0930	Preservation/pH/checked
	TestAmerica-Westfield	, pje	BV (
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White = Lab file Yellow = Report copy Pink = Customer copy STL-8245 (1000)

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# WET CHEMISTRY PARAMETERS BY VARIOUS METHODS STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

Ans Ricard 61070909016 Reviewer/Date Sr. Review/Date Lab Report # Project #

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values stipulated in the QAPP. Where the QAPP does Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP,

-	however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to limits employed by the laboratory.  I aboratory Deliverable Requirements	EF, criteria win default to values supulated in the QAFF. Where the
,	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes [ ] No [	Yes [ ] No [ ] N/A [ ] Comments:
	Check items received.  Check items received.  Address  Address  Project ID Phone #	Sample identification – Field and Laboratory
	Client Information:      Address   Client Contact	(IDs must be cross-referenced)
CII	ACTION: If no, contact lab for submission of missing or illegible information.	
	1.2 Laboratory Report Certification Statement	Yes [ \( \int No [ ] N/A [ ] Comments:
	Does the laboratory report include a completed Analytical Report Certification in the required format?	quired format?
CTK	ACTION: If no, contact lab for submission of missing certification or certification with correct format.	rmat.
	1.3 Laboratory Case Narrative:	Yes [ No [ ] N/A [ ] Comments:
	☐ Narrative serves as an exception report for the project and method QA/QC performance.	arDelta Narrative includes an explanation of each discrepancy on the
		Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

No[] N/A[] Yes [Z 1.4 Chain of Custody (COC) copy present with all documentation completed?

Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

	Yes [Z	] %	N/A	Comments:	
☐ Sample temperature confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply). ☐ Container type noted ☐ Condition observed ☐ pH verified (where applicable) ☐ Field and lab IDs cross referenced	d on the same da IDs cross refere	ıy as collecti	on, temperatu	ue requirement o	does not apply).
ACTION: If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were the correct bottles and preservatives used?  Annuonia,—1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Oil & Grease—1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C	Yes	\ %	N/A []	Comments:	
Alkalinity – 1 Liter polyethylene/cool to 4°C  Chemical Oxygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C  Nitrate/nitrite - H2SO4 to pH<2,cool to 4°C					** **.
Organic Carbon – 500 mL amber glass bottle/HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				g v	
Phenolics - $\rm H_2SO_4$ to pH<2, cool to 4°C Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C					
ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment	<b>u</b> k				
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes [	] %	N/A	Comments:	
1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	h al Yes 📗 No 🗹	No [	N/A[_]	Comments:	

### WET CHEMISTRY PARAMETERS BY VARIOUS METHODS STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

Reporting limits I Date of preparation/extraction/digestion clean-up and analysis, where applicable ☐ % moisture or solids Comments: ☐ Units (soils must be reported in dry weight) N/A[ No[] Dilution Factor 1.6 Sample Results Section: Was the following information supplied in the laboratory Analyst Initials D'Preparation method Target analytes and concentrations 区 Date and time collected □/Aŋalysis method report for each sample? Field ID and Lab ID Clean-up method ☐ Matrix

ACTION: If no, contact lab for submission of missing or incomplete information.

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1.7 QA/QC Informati for each sample batch?	ormation: Was the folbatch?	1.7 QA/QC Information: Was the following information provided in the laboratory report Yes [	boratory report Ye		N/A [_]	Comments:	
回 Method blank results	ULCS recoveries	以MS/MSD recoveries and RPDs	☑ Laboratory duplic	ate results (where a	oplicable)		· ·
CTION: If no, contact	lab for submission of r	ACTION: If no, contact lab for submission of missing or incomplete information.					

## NoZ Holding Times 2.0

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Comments:

N/A

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

Comments:

N/A[]

No

Yes [ \( \int \)

### Laboratory Method 3.0

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

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## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS OLIN-WILMINGTON

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.	or chemist for a	action need	ed.	48
4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).	Yes [Z]	No [	N/A	Comments:
4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:  If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.	Yes	No	N/A	Comments:
If the sample concentration is $> 5 \times \text{blank}$ value, no qualification is needed.				
ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times \text{blank}$ value) on the checklist. List all qualifiers.	gging level = 5	× blank v	alue) on the c	hecklist. List all
5.0 Laboratory Control Standards				
5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes [Z]	] og	N/A	Comments:
ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.				
5.2 Is a LCS Summary Form present?	Yes [L]	No.	N/A[_]	Comments:
ACTION: If no, contact lab for resubmission of missing data.				
5.3 Is any wet chemistry analyte LCS recovery outside the control limits?	Yes [ ]	No [	N/A [_]	Comments:

affected samples and their

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## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS OLIN-WILMINGTON

	Specific Conductivity * $\square$ = 80-120% Ammonia Nitrogen as N* $\square$ = 80-120% Nitrite Nitrogen as N** $\square$ = 80-120% pH* $\square$ = 98-102% TSS* NA				mit, qualify all positive and no-detect results			Comments: The late justificated a comments:	Comments:	Comments:
	Carbonate Alkalinity** $\square = 80-120\%$ Oil & Grease* $\square = 80-120\%$ Nitrate Nitrogen as N** $\square = 80-120\%$ Sulfate (EPA 300.0)* $\square = 80-120\%$	Rec Limits=	□ Rec Limits =	ary limits for wet chemistry analyses.)	batch as (J). If recovery is below the lower lin		or task	iked.  Yes [ No [ ] N/A [ ] Cor  Cherry Cherry No [ ] N/A [ ] Cor  Yes [ Y No [ ] N/A [ ] Cor	oles per Yes [ No [ NA [ ]	Yes No A NA
	Bicarbonate Alkalinity** $\Box$ = 80-120% TDS** $\Box$ = 80-120% COD High* $\Box$ = 80-120% Chloride* $\Box$ = 80-120%	%R=	%R=	(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	qualify all positive sample results within the , non-detect results are rejected (R).		requencies based on monthly, quarterly, ents for each set with the senior chemist.	s analyzed? List project samples that were spiked. any were specified. m present?	Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?	all lab for resubmission. spike recoveries outside of the QC limits?
LCS Limits:	Alkalinity** $\square = 80-120\%$ Total Organic Carbon** $\square = 80-120\%$ COD Low* $\square = 80-120\%$ Hardness* $\square = 80-120\%$	Other parameter(list)	Other parameter(list)		TION hin th	.0 Matrix Spikes	Aatrix spikes may be collected at different frequencies based on monthly, quarterly, or task pecific schedules. Confirm spike requirements for each set with the senior chemist.	6.1 Were project-specific MS/MSDs analyzed? List project CTION: If no, contact senior chemist to see if any were specified.  6.2 Is the MS/MSD Recovery Form present?	6.3 Were matrix spikes analyzed at the require	CTION: If any matrix spike data is missing, call lab for resubmission.  6.4 Are any wet chemistry analyte spike recoveries outside

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## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

NOTE: %R SA	= (SSR-SR)	R) ×	100% SA = Spike added		Where:	SSR	II	Spiked sample SR = Sample	ked sample SR = Sample	result
MS/MSD Recovery Limits:										
Alkalinity* = NA	щ	icarbonate	Bicarbonate Alkalinity* = $NA$	Carbonate alkalinity* = NA	A	Ammonia* (LACHAT) $\square = 75-125\%$	CHAT)	□ = 75-12	%57	
Chloride*(SM 4500 CI) □ € 75-125%		pecific Cor	Specific Conductivity * = NA	Total Organic Carbon* = NA		TDS** = NA				
Oil & Grease* = $NA$		COD Low* $\Box = 7$	□ = 75-125%	COD High* $\Box = 75-125\%$	Ż	Nitrate Nitrogen as N** $\square = 75-125\%$	as N**	□ = 75-1	25%	
Nitrite Nitrogen as N** $\square = 75-125\%$		fardness*	Hardness* $\Box = 75-125\%$	Sulfate (EPA 300.0)* $\Box = 75-125\%$ pH* = NA	-125% pl	$I^* = NA$		TSS* = NA	Ą	
Other parameter(list)			%R =		☐ Rec Limits =					1
* = Laboratory Limits	** = Olin QAPP Limits	QAPP Lim		(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	its for wet	chemistry a	nalyses	S.)		

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R). ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit,

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

Yes No LA N/A 6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? D = MSD result NOTE: RPD =  $\frac{S - D}{(S + D)/2}$  x 100% Where S = MS result D = MSD result

Comments:

### MS/MSD RPD Limits:

RPD <20

## 7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes [ No [ N/A [ ] Comments:

## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS OLIN-WILMINGTON

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	pH* □ = 3% Specific Condu	Specific Conductivity *臣=5%	%9=□**SSL			%9 = □ **SQL	9	
8.0	Sampling Accuracy							
The 1	The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.	ed directly from a tap, I ollected.	rocess stream, or					ŧ
	8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.	evaluating rinsate blanks,		Yes []	No [A	N/A[_]	Comments:	*
	8.2 Do any rinsate blanks have positive results?	;		Yes	No [	N/A[J	Comments:	
ACT	ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.	ts to determine if contan ue, flag sample result non-c	ninant may be labora letect "U" at the PQL o	tory-deriv or the conce	ed. If not	lab-related, qi oorted if greatei	nalify according to than the PQL.	the table below.
	If the sample concentration is $> 5 \times \text{blank}$ value, no qualification is needed.	ue, no qualification is need	.pa					
NOT	NOTE: MADEP does not require the collection of rinsate blanks.	rinsate blanks.			ë			
0.6	Field Duplicates							
	9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.	? Obtain a list of samples		Yes []	Nº [	N/A	Comments:	
	9.2 Were field duplicates collected per the required frequency?	quired frequency?		Yes	No	N/A [L]	Comments:	
Ò	QAPP/IRSWP   MADEP Option 1(1 per 20)	☐ MADEP Option 3 (1 per 10) ☐	1 (1 per 10) 🏻	-				
	9.3 Was the RPD $\leq$ 30% for waters $\leq$ 50% for soils? Calculate the RPD for results and attach to this review.	r soils? Calculate the RP		Yes []	] °N	N/A[U	Comments:	

## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION:. Qualify data (J) for both sample results if the RPD exceeded.
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Was any of the data qualified?	Yes	No [L	N/A	Comments:	
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.					

### REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007. Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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### Version 1.2, Nov 2002

## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date / M/L (L. 7/22/Fr.
Sr. Review/Date ( h/1/5 ( COACh. 8/2
Lab Report # 3 c.D. 22 55 5-1
Project # C. 10 705006

Missolued aluminum and chowine

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes [ No [ ] N/A [ ] Check items received.	No [ ] N/A [ ] Comments:
ny 🗹 Address 🖸 Project ID 🖻 Phone #	Sample identification – Field and Laboratory
Client Information:	(IDs must be cross-referenced)
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement	Yes [ \ \ No [ ] N/A [ ] Comments:
Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	
1.3 Laboratory Case Narrative:	No [ ] N/A [ ] Comments:
$oxedsymbol{\mathbb{Z}}$ Narrative serves as an exception report for the project and method QA/QC performance. on the	☐ Narrative includes an explanation of each discrepanc
	Certification Statement.
ACTION: If no, contact lab for submission of missing or illegible information.	

ACTION: If no, contact lab for submission of copy of completed COC.

NOTE: Olin receives and maintains the original COC.

1.4 Chain of Custody (COC) copy present with all documentation completed

Comments:

Yes | No NA |

1.5 Sample Receipt Information (Cooler Receipt Form present?):  Yes Moll N/A Comments:
Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?
Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).  Container type noted Example condition observed phy verified (where applicable) Field and lab IDs cross referenced
ACTION: If no, contact lab for submission of missing or incomplete documentation.
1.5.1 Were all samples delivered to the laboratory without breakage?  Yes   I N/A [ ] Comments:
1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special Yes [ ] No [ ] Comments: circumstances affecting the quality of the data?
1.6 Sample Results Section: Was each of the following requirements supplied in the Yes 🔼 No 📋 N/A 📋 Comments: laboratory report for each sample?
Field ID and Lab ID
ACTION: If no, contact lab for submission of missing or incomplete information.
1.7 QA/QC Information: Was each of the following information supplied in the Yes [ ] N/A [ ] Comments: laboratory report for each sample batch?

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Method blank results	od blank 1	results LLCS recoveries		Z MS/MS	MS/MSD recoveries and RPDs		Laboratory	duplicate re	sults (wher	画 Laboratory duplicate results (where applicable)		
ACTION	√: If no, α	ACTION: If no, contact lab for submission of	sion of mis	ssing or inc	missing or incomplete information.							
2.0 ₺	Holding Times	Times										
Have any	y technical ho exceeded? Ho water and soil.	al holding times, det? Holding time for n: I soil.	ermined fr	om date	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil.	of analy o analysi	s for both	Yes	No [	N/A	Comments:	ents:
NOTE: I	ist samp	NOTE: List samples that exceed hold time with # of days exceeded on checklist	me with#	of days ex	ceeded on checklist							
ACTION	V: If tecl (UJ). If g	mical holding times s grossly exceeded (2X	are exceeds holding tin	ed, qualify ne) reject (	ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.	J) and no ilts.	on-detects					
3.0	Laborat	Laboratory Method										
* 3* 1	3.1	Was the correct laboratory method used?	oratory m	ethod use	;q;			Yes	No	Yes [ No [ N/A [	Comments:	ents:
	The STATE OF THE S	Water Digestion Soil Digestion Metals	300. 305( 601(	3005A or 3010 <sub>2</sub> 3050B 6010B or 200.7	3005A or 3010A or 3020A 3050B 6010B or 200.7							
ACTI compa and to	ON: If red to the request	ACTION: If no, contact laboratory compared to the requested method. Co and to request variance.	ratory to	provide	ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.	method Client o	change f change		5			
70 <b>.3</b> 00 <b>0</b>	3.2	Are the practical q	prantitation QAPP	limits t	Are the practical quantitation limits the same as those specified by the \$\sim\$SOW \$\supersquare{G}\QAPP\$ \$\supersquare{G}\Dapp\$ \$\supers	specifiec	1 by the	Yes	] oN	N/A	Comments:	ents:
NOTE	: Verify ti	hat the reported metal	s match th	e target lis	NOTE: Verify that the reported metals match the target list specified on the COC.	Ċ						

Are results present for each sample in the SDG?

3.3

Yes [ No No N/A Comments:

ACTION: If	ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data	was sent, and	d contact la	d for resubm	ssion of the missing o	data
3.4	If dilutions were required, were dilution factors reported?	Yes [	No	No [ ] N/A [ ]	Comments:	
ACTION: If	ACTION: If no, contact the lab for submission.					
4.0 <u>Met</u>	Method Blanks					
4.1	Is the Method Blank Summary present?	Yes [	No	Yes [ No [ ] N/A [ ]	Comments:	
ACTION:	ACTION: If no, call the laboratory for submission of missing data.					
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion $\mathbf{Yes}[\mathcal{M}]$ No $[\ ]$ N/A $[\ ]$ batch of < 20 field samples?	Yes [L]	] %	N/A	Comments:	
ACTION: needed. Na	ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.					7
4.3	Is the method blank less than the PQLs for all target elements?	\	,	3 3 3 3 9		
NOTE: MA	NOTE: MADEP requires the method blank to be matrix matched and digested with the samples	Yes 🔼		No NA []	Comments:	
<b>4.4</b> the fo	Do any method blanks have positive results for metals? Qualify data according to llowing:	Yes	No [] N/A[]	N/A	Comments:	

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times \text{blank}$  value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

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and the same	Oratory
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0	0.0

<b>5.1</b> Was a laboratory control stan samples or less?	Was a laboratory control standard run with each analytical batch of $20$ Yes $\mathcal{L}$ No $\mathcal{L}$ No $\mathcal{L}$ Comments: samples or less?	Yes [ No [	□ N/A [	Comments:
NOTE: A full target, second source LCS is required by MADEP. ACTION: Call laboratory for LCS form submittal. If data are not av professional judgement to evaluate data accuracy associated with that batch.	NOTE: A full target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.			
5.2 Is a LCS Summary Form present?	esent?	Yes \( \subseteq No \( \supseteq N/A \( \supseteq \) Comments:	□ N/A [	Comments:
ACTION: If no, contact lab for resubmission of missing data.	sion of missing data.		,	

Comments:

Yes No No

Is the recovery of any analyte outside of MADEP control limits?

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is <30%, positive and nondetect results are rejected (R).

within Lab generated limits

**MADEP** % Rec 80-120

Sample Type Water Soil

5.3

Comments:

5 of 10

### STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION - OPTION 1 ICP METALS BY METHOD 6010B/200.7 **OLIN CORPORATION**

### Matrix Spikes 0.9

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

List project samples that were Yes [ No [ ] N/A [ ] Comments: The lub parkenal a MS amby sis on souple Were project-specific MS/MSDs collected? (3/2/+@) andy zel 6.1

OC-CW-425.

Yes [L] No [ ] N/A [ ] Comments: Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

ACTION: If no, contact senior chemist to see if any were specified.

ACTION: If any matrix spike data are missing, call lab for resubmission. NOTE: A full target, second source MS/MSD is required by MADEP.

Were matrix spikes analyzed as indicated on the COC and project Yes [ J No [ ] N/A [ ] Comments: schedule? 6.3

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

Yes No No NA Comments: Are any metal spike recoveries outside of the QC limits? 6.4

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

SR = Sample result Where: SSR = Spiked sample result  $%R = (SSR-SR) \times 100\%$ NOTE:

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the

data are evaluated, but no flags are applied.

6010.doc

SA = Spike added

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS results and non-detects (J).

An MSD analysis was not pertined. Yes No NA Comments: Where: S = MS sample result Are any RPDs for MS/MSD recoveries outside of the QC limits? D = MSD sample result \_ x 100% NOTE: RPD = S-D (S+D)/2 6.5

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied. ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects

## 7.0 Laboratory Duplicate

Comments: 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ ] No [ ] N/A [ Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes No No NA Comments:

OAPP RPD	20	20	20	20
MADEP Laboratory Duplicate Sample RPD Criteria:	For aqueous results > $5x$ RL, RPD must be $\pm 20\%$	For aqueous results < $5x$ RL, RPD must be $\leq$ RL	For soil/sediment results > $5x$ RL, RPD must be $\pm 35\%$	For soil/sediment results < $5 \times$ RL, RPD must be < $2 \times$ RL

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

## 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of Yes [ ] No [ MA [ ] Comments: the associated samples from the senior chemist.  8.2 Do any rinsate blanks have positive results?
<ul><li>8.1 Were rinsate the associated samples</li><li>8.2 Do any rinsat</li></ul>

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

### 9.0 Field Duplicates

N/A[] 9.1 Were field duplicate samples collected? Obtain a list of samples and their associated Yes [ No | \inf \text{In} field duplicates.

Comments:

6010.doc

## LEVEL I DATA QUALITY EVALUATION - OPTION 1 **OLIN CORPORATION**

|--|

ACTION: If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

9 of 10

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Comments:	
N/A[ ]	
NoI	
Yes [ ]	
as any of the data qualified?	
Was a	

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.





### ANALYTICAL REPORT

Job Number: 360-22658-1

Job Description: Slurry Wall/Cap

For:

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

Joseph a. Chem. J.

Approved for release. Joe Chimi Report Production Representative 6/1/09 2:21 PM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
06/01/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002



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Laborator	y Name:	TestAmeric	ca Westfield		Proj	ect #:	360-	22658	-1
Project Lo	cation:	Slurry Wall/	Сар		MADEP	RTN <sup>1</sup> :			
his form	provides certific	cations for the f	ollowing data set	t:[list Laborator	ry Sample ID Nur	mber(s)]			
860-2265	3-(1-18)								
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### CASE NARRATIVE

**Client: Olin Corporation** 

**Project: Slurry Wall/Cap** 

Report Number: 360-22658-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/15/2009; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 2.8 and 4.8°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

### **DISSOLVED METALS**

Samples 360-22658-1 through 360-22658-18 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/18/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

### General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

### **ANIONS**

Samples 360-22658-1 through 360-22658-18 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/19/2009, 05/20/2009 and 05/22/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22658-2(10X), 360-22658-4 through 360-22658-6(10X), 360-22658-10(10X), 360-22658-11(10X), 360-22658-13(10X), 360-22658-15(10X), 360-22658-16(20X), 360-22658-16(50X), 360-22658-17(10X) and 360-22658-18(20X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

### **AMMONIA**

Samples 360-22658-1 through 360-22658-18 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/28/2009, 05/29/2009 and 06/01/2009.

All QC performance standards and recommendations for this specific method were achieved with the exception of:

Ammonia failed the MS/MSD recovery criteria high for the matrix spike duplicate of sample 360-22658-8MSD and exceeded the MS/MSD rpd limit. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-22658-2(10X), 360-22658-4(10X), 360-22658-5(10X), 360-22658-11(10X), 360-22658-13(10X), 360-22658-14(5X), 360-22658-15(20X), 360-22658-16(20X), 360-22658-17(10X) and 360-22658-18(20X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22658-1 through 360-22658-18 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/18/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

Client: Olin Corporation Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / (	Qualifier	Reporting Limit	Units	Method
360-22658-1	OC-GW-10S					
Sulfate Chloride Ammonia Specific Conductand	ce	41 5.2 1.0 110		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum		3100		100	ug/L	6010B
360-22658-2	OC-GW-26					
Sulfate Chloride Ammonia Specific Conductano	ce	160 180 74 1000		20 10 1.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum Chromium		2.9 20	J	100 5.0	ug/L ug/L	6010B 6010B
360-22658-3	OC-GW-78S					
Sulfate Chloride Ammonia Specific Conductand	ce	38 11 11 170		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum Chromium		7.2 2.4	J J	100 5.0	ug/L ug/L	6010B 6010B
360-22658-4	OC-GW-25					
Sulfate Chloride Ammonia Specific Conductand	ce	120 37 53 570		20 10 1.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Chromium		3.7	J	5.0	ug/L	6010B

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / C	tualifier	Reporting Limit	Units	Method	
360-22658-5	OC-PZ-18R						
Sulfate Chloride Ammonia Specific Conductance	e	240 180 62 1200		20 10 1.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
<b>Dissolved</b> Aluminum Chromium	* ·	3.6 18	Ĵ	100 5.0	ug/L ug/L	6010B 6010B	
360-22658-6	OC-GW-39						
Sulfate Chloride Ammonia Specific Conductance	320	500 19 0.15 910		20 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
Dissolved Aluminum		91	J	100	ug/L	6010B	
360-22658-7	OC-GW-34SR						
Sulfate Chloride Ammonia Specific Conductance	e	7.1 1.1 0.27 65		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
Dissolved Chromium		0.52	J	5.0	ug/L	6010B	
360-22658-8	OC-GW-34D						
Sulfate Chloride Ammonia Specific Conductanc	e	37 14 15 <b>3</b> 210		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
<b>Dissolved</b> Aluminum Chromium		4.0 13	J	100 5.0	ug/L ug/L	6010B 6010B	
			M	Mulita	e o		

TestAmerica Westfield

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result /	Qualifier	Reporting Limit	Units	Method	
360-22658-9	OC-GW-34D DUP						
Sulfate Chloride Ammonia Specific Conductanc	e	38 15 14 3 210		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
Dissolved		4.7	1	400		CO40D	
Aluminum Chromium		4.7 13	J	100 5.0	ug/L ug/L	6010B 6010B	
360-22658-10	OC-GW-55S						
Sulfate Chloride Ammonia Specific Conductanc	e	1100 180 15 2800		20 10 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
<b>Dissolved</b> Aluminum Chromium		470 1.8	J	100 5.0	ug/L ug/L	6010B 6010B	
360-22658-11	OC-PZ-17RR						
Sulfate Chloride Ammonia Specific Conductano	ce	550 18 62 1400		20 1.0 1.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
Dissolved Chromium		3.2	J	5.0	ug/L	6010B	
360-22658-12	OC-GW-CA1						
Sulfate Chloride Ammonia Specific Conductano	ce	39 2.1 0.40 390		2.0 1.0 0.10 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B	
<b>Dissolved</b> Aluminum Chromium		6.0 0.92	J J	100 5.0	ug/L ug/L	6010B 6010B	
			MA	With	~ 12plo9		
TestAmerica Westf	ield		100		i i		

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Client: Olin Corporation Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / 0	Qualifier	Reporting Limit	Units	Method
360-22658-13	OC-GW-78S					
Sulfate Chloride Ammonia Specific Conductance	ce	620 21 71 1400		20 1.0 1.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
Dissolved						
Aluminum Chromium		3.4 3.5	J	100 5.0	ug/L ug/L	6010B 6010B
360-22658-14	OC-GW-24					
Sulfate Chloride Ammonia Specific Conductance	ce	68 6.3 36 350		2.0 1.0 0.50 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum		4.0	J	100	ug/L	6010B
360-22658-15	OC-PZ-16RR					
Sulfate Chloride Ammonia Specific Conductance	ce	950 160 190 2600		20 10 2.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Chromium		7.4		5.0	ug/L	6010B
360-22658-16	OC-GW-202D					
Sulfate Chloride Ammonia Specific Conductance	ce	2600 370 360 5000		100 20 2.0 1.0	mg/L mg/L mg/L umhos/cm	300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum Chromium		18000 1200		100 5.0	ug/L ug/L	6010B 6010B

Client: Olin Corporation Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result /	Qualifier	Reporting Limit	Units	Method
360-22658-17	OC-GW-202S					
Sulfate		490		20	mg/L	300.0
Chloride		53		10	mg/L	300.0
Ammonia		120		1.0	mg/L	L107-06-1B
Specific Conductano	ce	1300		1.0	umhos/cm	SM 2510B
Dissolved						
Aluminum		3.7	J	100	ug/L	6010B
Chromium		4.6	J	5.0	ug/L	6010B
360-22658-18	OC-GW-79S					
Sulfate		1300		40	mg/L	300.0
Chloride		190		20	mg/L	300.0
Ammonia		190		2.0	mg/L	L107-06-1B
Specific Conductano	ce	3300		1.0	umhos/cm	SM 2510B
Dissolved						
Aluminum		18	J	100	ug/L	6010B
Chromium		6.6		5.0	ug/L	6010B

### **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-22658-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals Sample Filtration, Field	TAL WFD TAL WFD	SW846 6010B FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia Distillation, Ammonia	TAL WFD TAL WFD	LACHAT L107-06-1B Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

### Lab References:

TAL WFD = TestAmerica Westfield

### **Method References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### **METHOD / ANALYST SUMMARY**

Client: Olin Corporation Job Number: 360-22658-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

### **SAMPLE SUMMARY**

Client: Olin Corporation Job Number: 360-22658-1

	<b>0</b> !! ( <b>11</b> ( )	Date/Time	Date/Time
Client Sample ID	Client Matrix	Sampled	Received
OC-GW-10S	Ground Water	05/13/2009 0945	05/15/2009 1615
OC-GW-26	Ground Water	05/13/2009 0935	05/15/2009 1615
OC-GW-78S	Ground Water	05/13/2009 1105	05/15/2009 1615
OC-GW-25	Ground Water	05/13/2009 1150	05/15/2009 1615
OC-PZ-18R	Ground Water	05/13/2009 1305	05/15/2009 1615
OC-GW-39	Ground Water	05/13/2009 1305	05/15/2009 1615
OC-GW-34SR	Ground Water	05/13/2009 1430	05/15/2009 1615
OC-GW-34D	Ground Water	05/13/2009 1435	05/15/2009 1615
OC-GW-34D MS	Ground Water	05/13/2009 1435	05/15/2009 1615
OC-GW-34D MSD	Ground Water	05/13/2009 1435	05/15/2009 1615
OC-GW-34D DUP	Ground Water	05/13/2009 1435	05/15/2009 1615
OC-GW-55S	Ground Water	05/14/2009 0950	05/15/2009 1615
OC-PZ-17RR	Ground Water	05/14/2009 1105	05/15/2009 1615
OC-GW-CA1	Ground Water	05/14/2009 1235	05/15/2009 1615
OC-GW-78S	Ground Water	05/14/2009 1255	05/15/2009 1615
OC-GW-24	Ground Water	05/14/2009 1405	05/15/2009 1615
OC-PZ-16RR	Ground Water	05/14/2009 1430	05/15/2009 1615
OC-GW-202D	Ground Water	05/15/2009 0920	05/15/2009 1615
OC-GW-202S	Ground Water	05/15/2009 0905	05/15/2009 1615
OC-GW-79S	Ground Water	05/15/2009 1035	05/15/2009 1615
	OC-GW-26 OC-GW-78S OC-GW-25 OC-PZ-18R OC-GW-39 OC-GW-34SR OC-GW-34D MS OC-GW-34D MS OC-GW-34D DUP OC-GW-55S OC-PZ-17RR OC-GW-CA1 OC-GW-78S OC-GW-24 OC-PZ-16RR OC-GW-202D OC-GW-202S	OC-GW-10S OC-GW-26 OC-GW-28 OC-GW-78S OC-GW-25 OC-PZ-18R OC-GW-39 OC-GW-34SR OC-GW-34D	Client Sample ID         Client Matrix         Sampled           OC-GW-10S         Ground Water         05/13/2009 0945           OC-GW-26         Ground Water         05/13/2009 0935           OC-GW-78S         Ground Water         05/13/2009 1105           OC-GW-25         Ground Water         05/13/2009 1305           OC-GW-39         Ground Water         05/13/2009 1305           OC-GW-34SR         Ground Water         05/13/2009 1430           OC-GW-34D         Ground Water         05/13/2009 1435           OC-GW-34D MS         Ground Water         05/13/2009 1435           OC-GW-34D MSD         Ground Water         05/13/2009 1435           OC-GW-34D DUP         Ground Water         05/13/2009 1435           OC-GW-55S         Ground Water         05/14/2009 0950           OC-PZ-17RR         Ground Water         05/14/2009 1235           OC-GW-CA1         Ground Water         05/14/2009 1255           OC-GW-78S         Ground Water         05/14/2009 1405           OC-GW-24         Ground Water         05/14/2009 1430           OC-GW-202D         Ground Water         05/15/2009 0920           OC-GW-202S         Ground Water         05/15/2009 0905

### **SAMPLE RESULTS**

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-10S Lab Sample ID: 360-22658-1 Date Sampled: 05/13/2009 0945 Date Received: 05/15/2009 1615 Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 05/1	8/2009 1227	
Aluminum	3100	ug/L	2.2	100	1.0
Chromium	ND	ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-10S Lab Sample ID: 360-22658-1 Date Sampled: 05/13/2009 0945
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/19/2009 1832	
Sulfate	41	mg/L	2.0	2.0	1.0
Chloride	5.2	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	05/28/2009 1415	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/28/2009 1110	
Ammonia	1.0	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1111	
Specific Conductance	110	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-26 Lab Sample ID: 360-22658-2 Date Sampled: 05/13/2009 0935 Date Received: 05/15/2009 1615 Client Matrix: Ground Water

Analyte	Result/Qualifi	er	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 05/1	8/2009 1236	
Aluminum	2.9	J	ug/L	2.2	100	1.0
Chromium	20		ug/L	0.17	5.0	1.0

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Client Sample ID: OC-GW-26 Lab Sample ID: 360-22658-2 Date Sampled: 05/13/2009 0935 Date Received: 05/15/2009 1615 Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Analyzed:		05/19/2009 1917	
Sulfate	160	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B		Date Analyzed:		05/28/2009 1431	
Prep Method: Distill/Ammonia		Date Prepared:		05/28/2009 1110	
Ammonia	74	mg/L	1.0	1.0	10
Method: SM 2510B		Date Analyzed:		05/18/2009 1112	
Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-78S Lab Sample ID: 360-22658-3

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	Analyzed: 05/1	8/2009 1238	
Aluminum	7.2 J	ug/L	2.2	100	1.0
Chromium	2.4 J	ua/L	0.17	5.0	1.0

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Cleveland, TN 37312-4441

Client Sample ID: OC-GW-78S Lab Sample ID: 360-22658-3

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/19/2009 1932	
Sulfate	38	mg/L	2.0	2.0	1.0
Chloride	11	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	05/28/2009 1419	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/28/2009 1110	
Ammonia	11	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1114	
Specific Conductance	170	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-25 Lab Sample ID: 360-22658-4

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	Analyzed: 05/1	8/2009 1241	
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	3.7 J	ug/L	0.17	5.0	1.0

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Client Sample ID: OC-GW-25 Lab Sample ID: 360-22658-4

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	alyzed:	05/19/2009 2048	
Sulfate	120	mg/L	20	20	10
Chloride	37	mg/L	10	10	10
Method: L107-06-1B		Date Ana	alyzed:	05/28/2009 1432	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/28/2009 1110	
Ammonia	53	mg/L	1.0	1.0	10
Method: SM 2510B		Date Ana	alyzed:	05/18/2009 1115	
Specific Conductance	570	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-PZ-18R Lab Sample ID: 360-22658-5

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	Analyzed: 05/1	8/2009 1244	
Aluminum	3.6 J	ug/L	2.2	100	1.0
Chromium	18	ug/L	0.17	5.0	1.0

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Cleveland, TN 37312-4441

Client Sample ID: OC-PZ-18R Lab Sample ID: 360-22658-5

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/19/2009 2118	
Sulfate	240	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B		Date Ana	ılyzed:	05/28/2009 1433	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/28/2009 1110	
Ammonia	62	mg/L	1.0	1.0	10
Method: SM 2510B		Date Ana	ılyzed:	05/18/2009 1117	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-39 Lab Sample ID: 360-22658-6

Analyte	Result/Qualific	er	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 0	05/18/2009 1247	
Aluminum	91	J	ug/L	2.2	100	1.0
Chromium	ND		ug/L	0.17	5.0	1.0

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Client Sample ID: OC-GW-39 Lab Sample ID: 360-22658-6

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/19/2009 2133	
Chloride	19	mg/L	1.0	1.0	1.0
Method: 300.0		Date Ana	lyzed:	05/19/2009 2148	
Sulfate	500	mg/L	20	20	10
Method: L107-06-1B		Date Ana	lyzed:	05/28/2009 1422	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/28/2009 1110	
Ammonia	0.15	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1118	
Specific Conductance	910	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-34SR Lab Sample ID: 360-22658-7

Analyte	Result/Qualific	er	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 0	5/18/2009 1250	
Aluminum	ND		ug/L	2.2	100	1.0
Chromium	0.52	J	ug/L	0.17	5.0	1.0

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Client Sample ID: OC-GW-34SR Lab Sample ID: 360-22658-7

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date An	nalyzed:	05/19/2009 2203	
Sulfate	7.1	mg/L	2.0	2.0	1.0
Chloride	1.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date An	alyzed:	05/28/2009 1423	
Prep Method: Distill/Ammonia		Date Pr	epared:	05/28/2009 1110	
Ammonia	0.27	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date An	alyzed:	05/18/2009 1119	
Specific Conductance	65	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-34D Lab Sample ID: 360-22658-8

Analyte	Result/Qualifie	er Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Da	te Analyzed:	05/18/2009 1215	
Aluminum	4.0	l ug/L	2.2	100	1.0
Chromium	13	ua/L	0.17	5.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-34D Lab Sample ID: 360-22658-8 Job Number: 360-22658-1

Date Sampled: 05/13/2009 1435 Date Received: 05/15/2009 1615 Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/20/2009 0004	
Sulfate	37	mg/L ·	2.0	2.0	1.0
Chloride	14	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	06/01/2009 1204	
Prep Method: Distill/Ammonia		Date Pre	pared:	06/01/2009 0857	
Ammonia	15 🏅	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1121	
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

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Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-34D DUP Lab Sample ID: 360-22658-9

Analyte	Result/Qualifie	r Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date	Analyzed: 05/1	18/2009 1253	
Aluminum	4.7 J	ug/L	2.2	100	1.0
Chromium	13	ug/L	0.17	5.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441 Job Number: 360-22658-1

Client Sample ID: OC-GW-34D DUP Lab Sample ID: 360-22658-9 Date Sampled: 05/13/2009 1435 Date Received: 05/15/2009 1615 Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	lyzed:	05/19/2009 2233	
Sulfate	38	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	06/01/2009 1204	
Prep Method: Distill/Ammonia		Date Pre	pared:	06/01/2009 0857	
Ammonia	14 🕇	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	ilyzed:	05/18/2009 1122	
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

Wille History

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-55S Lab Sample ID: 360-22658-10

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	Analyzed: 05/1	8/2009 1256	
Aluminum	470	ug/L	2.2	100	1.0
Chromium	1.8 J	ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-55S Lab Sample ID: 360-22658-10

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date An	alyzed:	05/20/2009 0119	
Sulfate	1100	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B		Date An	alyzed:	05/28/2009 1428	
Prep Method: Distill/Ammonia		Date Pro	epared:	05/28/2009 1110	
Ammonia	15	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date An	alyzed:	05/18/2009 1124	
Specific Conductance	2800	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-PZ-17RR Lab Sample ID: 360-22658-11

Analyte	Result/Qualifie	r Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Da	te Analyzed:	05/18/2009 1258	
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	3.2 J	ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-PZ-17RR Lab Sample ID: 360-22658-11

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/20/2009 0134	
Chloride	18	mg/L	1.0	1.0	1.0
Method: 300.0		Date Ana	ılyzed:	05/20/2009 0150	
Sulfate	550	mg/L	20	20	10
Method: L107-06-1B		Date Ana	ılyzed:	05/29/2009 1559	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	62	mg/L	1.0	1.0	10
Method: SM 2510B		Date Ana	ılyzed:	05/18/2009 1125	
Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-CA1 Lab Sample ID: 360-22658-12

Analyte	Result/Qua	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 05/1	8/2009 1301	
Aluminum	6.0	J	ug/L	2.2	100	1.0
Chromium	0.92	J	ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-CA1 Lab Sample ID: 360-22658-12

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/20/2009 0205	
Sulfate	39	mg/L	2.0	2.0	1.0
Chloride	2.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	05/29/2009 1550	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	0.40	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1127	
Specific Conductance	390	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-GW-78S Lab Sample ID: 360-22658-13

Analyte	Result/Qualif	ier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 05/1	8/2009 1310	
Aluminum	3.4	J	ug/L	2.2	100	1.0
Chromium	3.5	J	ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-78S Lab Sample ID: 360-22658-13

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date An	alyzed:	05/20/2009 0305	
Chloride	21	mg/L	1.0	1.0	1.0
Method: 300.0		Date An	alyzed:	05/20/2009 1730	
Sulfate	620	mg/L	20	20	10
Method: L107-06-1B		Date An	alyzed:	05/29/2009 1600	
Prep Method: Distill/Ammonia		Date Pre	epared:	05/29/2009 1410	
Ammonia	71	mg/L	1.0	1.0	10
Method: SM 2510B		Date An	alyzed:	05/18/2009 1128	
Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-24 Lab Sample ID: 360-22658-14

Analyte	Result/Quali	fier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 05/1	8/2009 1313	
Aluminum	4.0	J	ug/L	2.2	100	1.0
Chromium	ND		ug/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-24 Lab Sample ID: 360-22658-14

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/20/2009 0320	
Sulfate	68	mg/L	2.0	2.0	1.0
Chloride	6.3	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Ana	lyzed:	05/29/2009 1601	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	36	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1130	
Specific Conductance	350	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-PZ-16RR Lab Sample ID: 360-22658-15

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 05/1	8/2009 1316	
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	7.4	ug/L	0.17	5.0	1.0

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Client Sample ID: OC-PZ-16RR Lab Sample ID: 360-22658-15

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Analyzed:		05/20/2009 1629	
Sulfate	950	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Method: L107-06-1B		Date Ana	ılyzed:	05/29/2009 1602	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B		Date Analyzed:		05/18/2009 1131	
Specific Conductance	2600	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-202D Lab Sample ID: 360-22658-16

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 05/1	8/2009 1319	
Aluminum	18000	ug/L	2.2	100	1.0
Chromium	1200	ua/L	0.17	5.0	1.0

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Client Sample ID: OC-GW-202D Lab Sample ID: 360-22658-16

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	ılyzed:	05/20/2009 1800	
Chloride	370	mg/L	20	20	20
Method: 300.0		Date Ana	lyzed:	05/22/2009 0347	
Sulfate	2600	mg/L	100	100	50
Method: L107-06-1B		Date Ana	lyzed:	05/29/2009 1603	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	360	mg/L	2.0	2.0	20
Method: SM 2510B		Date Ana	lyzed:	05/18/2009 1133	
Specific Conductance	5000	umhos/cm	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-202S Lab Sample ID: 360-22658-17

Analyte	Result/Qualific	er l	Jnit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ana	alyzed: 05	/18/2009 1321	
Aluminum	3.7	J u	g/L	2.2	100	1.0
Chromium	4.6	J u	a/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-202S Lab Sample ID: 360-22658-17

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	alyzed:	05/20/2009 1745	
Sulfate	490	mg/L	20	20	10
Chloride	53	mg/L	10	10	10
Method: L107-06-1B		Date Analyzed:		05/29/2009 1604	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	120	mg/L	1.0	1.0	10
Method: SM 2510B		Date Analyzed:		05/18/2009 1134	
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-79S Lab Sample ID: 360-22658-18

Analyte	Result/Qualit	fier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 05/1	8/2009 1324	
Aluminum	18	J	ug/L	2.2	100	1.0
Chromium	6.6		ua/L	0.17	5.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: OC-GW-79S Lab Sample ID: 360-22658-18

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Ana	alyzed:	05/20/2009 1815	
Sulfate	1300	mg/L	40	40	20
Chloride	190	mg/L	20	20	20
Method: L107-06-1B		Date Analyzed:		05/29/2009 1607	
Prep Method: Distill/Ammonia		Date Pre	pared:	05/29/2009 1410	
Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B		Date Analyzed:		05/18/2009 1140	
Specific Conductance	3300	umhos/cm	1.0	1.0	1.0

# **DATA REPORTING QUALIFIERS**

Client: Olin Corporation Job Number: 360-22658-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	F	MS or MSD exceeds the control limits
	F	RPD of the MS and MSD exceeds the control limits

# **QUALITY CONTROL RESULTS**

# **Quality Control Results**

Client: Olin Corporation Job Number: 360-22658-1

### **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-445	54				
LCS 360-44554/1	Lab Control Sample	T	Water	6010B	
LCSD 360-44554/8	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-44554/2	Method Blank	T	Water	6010B	
360-22658-1	OC-GW-10S	D	Water	6010B	
360-22658-2	OC-GW-26	D	Water	6010B	
360-22658-3	OC-GW-78S	D	Water	6010B	
360-22658-4	OC-GW-25	D	Water	6010B	
360-22658-5	OC-PZ-18R	D	Water	6010B	
360-22658-6	OC-GW-39	D	Water	6010B	
360-22658-7	OC-GW-34SR	D	Water	6010B	
360-22658-8	OC-GW-34D	D	Water	6010B	
360-22658-8MS	Matrix Spike	D	Water	6010B	
360-22658-8MSD	Matrix Spike Duplicate	D	Water	6010B	
360-22658-9	OC-GW-34D DUP	D	Water	6010B	
360-22658-10	OC-GW-55S	D	Water	6010B	
360-22658-11	OC-PZ-17RR	D	Water	6010B	
360-22658-12	OC-GW-CA1	D	Water	6010B	
360-22658-13	OC-GW-78S	D	Water	6010B	
360-22658-14	OC-GW-24	D	Water	6010B	
360-22658-15	OC-PZ-16RR	D	Water	6010B	
360-22658-16	OC-GW-202D	D	Water	6010B	
360-22658-17	OC-GW-202S	D	Water	6010B	
360-22658-18	OC-GW-79S	D	Water	6010B	

Report Basis
D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-22658-1

# **QC Association Summary**

		Report	<b></b>	•• 4	
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
<b>General Chemistry</b>					
Analysis Batch:360-44548					
LCS 360-44548/1	Lab Control Sample	T	Water	SM 2510B	
LCS 360-44548/25	Lab Control Sample	Т	Water	SM 2510B	
MB 360-44548/2	Method Blank	T	Water	SM 2510B	
MB 360-44548/24	Method Blank	T	Water	SM 2510B	
360-22658-1	OC-GW-10S	Т	Water	SM 2510B	
360-22658-2	OC-GW-26	Τ	Water	SM 2510B	
360-22658-3	OC-GW-78S	Τ	Water	SM 2510B	
360-22658-4	OC-GW-25	T	Water	SM 2510B	
360-22658-5	OC-PZ-18R	T	Water	SM 2510B	
360-22658-6	OC-GW-39	T	Water	SM 2510B	
360-22658-7	OC-GW-34SR	T	Water	SM 2510B	
360-22658-8	OC-GW-34D	T	Water	SM 2510B	
360-22658-9	OC-GW-34D DUP	T	Water	SM 2510B	
360-22658-10	OC-GW-55S	T	Water	SM 2510B	
360-22658-11	OC-PZ-17RR	Т	Water	SM 2510B	
360-22658-12	OC-GW-CA1	Т	Water	SM 2510B	
360-22658-13	OC-GW-78S	Т	Water	SM 2510B	
360-22658-14	OC-GW-24	Т	Water	SM 2510B	
360-22658-15	OC-PZ-16RR	Т	Water	SM 2510B	
360-22658-16	OC-GW-202D	Т	Water	SM 2510B	
360-22658-17	OC-GW-202S	T	Water	SM 2510B	
360-22658-18	OC-GW-79S	Т	Water	SM 2510B	
360-22658-18DU	Duplicate	T	Water	SM 2510B	
Analysis Batch:360-44617					
LCS 360-44617/2	Lab Control Sample	Т	Water	300.0	
MB 360-44617/1	Method Blank	T	Water	300.0	
360-22658-1	OC-GW-10S	T	Water	300.0	
360-22658-2	OC-GW-103	T T	Water	300.0	
360-22658-3	OC-GW-78S	T T	Water	300.0	
		T T	Water		
360-22658-4	OC-GW-25	T	Water	300.0	
360-22658-5	OC-PZ-18R OC-GW-39	T	Water	300.0	
360-22658-6	OC-GW-34SR	T		300.0 300.0	
360-22658-7			Water		
360-22658-9	OC-GW-34D DUP	T	Water	300.0	

Client: Olin Corporation Job Number: 360-22658-1

### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-446	19				
LCS 360-44619/2	Lab Control Sample	Т	Water	300.0	
MB 360-44619/1	Method Blank	Т	Water	300.0	
360-22658-8	OC-GW-34D	Т	Water	300.0	
360-22658-8MS	Matrix Spike	Т	Water	300.0	
360-22658-8MSD	Matrix Spike Duplicate	Т	Water	300.0	
360-22658-10	OC-GW-55S	Т	Water	300.0	
360-22658-11	OC-PZ-17RR	Т	Water	300.0	
360-22658-12	OC-GW-CA1	Т	Water	300.0	
360-22658-13	OC-GW-78S	Т	Water	300.0	
360-22658-14	OC-GW-24	T	Water	300.0	
Prep Batch: 360-44909					
LCS 360-44909/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-44909/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-22658-1	OC-GW-10S	Т	Water	Distill/Ammonia	
360-22658-2	OC-GW-26	Т	Water	Distill/Ammonia	
360-22658-3	OC-GW-78S	Т	Water	Distill/Ammonia	
360-22658-4	OC-GW-25	Т	Water	Distill/Ammonia	
360-22658-5	OC-PZ-18R	Т	Water	Distill/Ammonia	
360-22658-6	OC-GW-39	Т	Water	Distill/Ammonia	
360-22658-7	OC-GW-34SR	Т	Water	Distill/Ammonia	
360-22658-8MSMS	Matrix Spike	Т	Water	Distill/Ammonia	
360-22658-8MSDMSD	Matrix Spike Duplicate	Т	Water	Distill/Ammonia	
360-22658-10	OC-GW-55S	T	Water	Distill/Ammonia	
Analysis Batch:360-449	16				
LCS 360-44909/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-44909
MB 360-44909/1-A	Method Blank	Т	Water	L107-06-1B	360-44909
360-22658-1	OC-GW-10S	Т	Water	L107-06-1B	360-44909
360-22658-2	OC-GW-26	Т	Water	L107-06-1B	360-44909
360-22658-3	OC-GW-78S	Т	Water	L107-06-1B	360-44909
360-22658-4	OC-GW-25	Т	Water	L107-06-1B	360-44909
360-22658-5	OC-PZ-18R	Т	Water	L107-06-1B	360-44909
360-22658-6	OC-GW-39	Т	Water	L107-06-1B	360-44909
360-22658-7	OC-GW-34SR	Т	Water	L107-06-1B	360-44909
360-22658-8MSMS	Matrix Spike	Т	Water	L107-06-1B	360-44909
360-22658-8MSDMSD	Matrix Spike Duplicate	Ť	Water	L107-06-1B	360-44909
360-22658-10	OC-GW-55S	Ť	Water	L107-06-1B	360-44909

Client: Olin Corporation Job Number: 360-22658-1

### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-4	4926				
LCS 360-44926/2	Lab Control Sample	T	Water	300.0	
MB 360-44926/1	Method Blank	Т	Water	300.0	
360-22658-13	OC-GW-78S	T	Water	300.0	
360-22658-15	OC-PZ-16RR	Т	Water	300.0	
360-22658-15MS	Matrix Spike	T	Water	300.0	
360-22658-15MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22658-16	OC-GW-202D	T	Water	300.0	
360-22658-17	OC-GW-202S	Т	Water	300.0	
360-22658-18	OC-GW-79S	T	Water	300.0	
Analysis Batch:360-4	4933				
LCS 360-44933/2	Lab Control Sample	T	Water	300.0	
MB 360-44933/1	Method Blank	T	Water	300.0	
360-22658-16	OC-GW-202D	T	Water	300.0	
Prep Batch: 360-4499	0				
LCS 360-44990/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44990/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22658-11	OC-PZ-17RR	T	Water	Distill/Ammonia	
360-22658-12	OC-GW-CA1	T	Water	Distill/Ammonia	
360-22658-13	OC-GW-78S	Т	Water	Distill/Ammonia	
360-22658-14	OC-GW-24	Т	Water	Distill/Ammonia	
360-22658-15	OC-PZ-16RR	Т	Water	Distill/Ammonia	
360-22658-16	OC-GW-202D	T	Water	Distill/Ammonia	
360-22658-17	OC-GW-202S	Т	Water	Distill/Ammonia	
360-22658-18	OC-GW-79S	Т	Water	Distill/Ammonia	
Analysis Batch:360-4	4996				
LCS 360-44990/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44990
MB 360-44990/1-A	Method Blank	T	Water	L107-06-1B	360-44990
360-22658-11	OC-PZ-17RR	T	Water	L107-06-1B	360-44990
360-22658-12	OC-GW-CA1	Т	Water	L107-06-1B	360-44990
360-22658-13	OC-GW-78S	T	Water	L107-06-1B	360-44990
360-22658-14	OC-GW-24	T	Water	L107-06-1B	360-44990
360-22658-15	OC-PZ-16RR	Т	Water	L107-06-1B	360-44990
360-22658-16	OC-GW-202D	Т	Water	L107-06-1B	360-44990
360-22658-17	OC-GW-202S	Т	Water	L107-06-1B	360-44990
360-22658-18	OC-GW-79S	Т	Water	L107-06-1B	360-44990
Prep Batch: 360-4501					
LCS 360-45018/2-A	Lab Control Sample	Т	Water	Distill/Ammonia	
MB 360-45018/1-A	Method Blank	Т	Water	Distill/Ammonia	
360-22658-8	OC-GW-34D	T	Water	Distill/Ammonia	
360-22658-9	OC-GW-34D DUP	Т	Water	Distill/Ammonia	

Client: Olin Corporation Job Number: 360-22658-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry	,				
Analysis Batch:360-4	5027				
LCS 360-45018/2-A	Lab Control Sample	T	Water	L107-06-1B	360-45018
MB 360-45018/1-A	Method Blank	T	Water	L107-06-1B	360-45018
360-22658-8	OC-GW-34D	T	Water	L107-06-1B	360-45018
360-22658-9	OC-GW-34D DUP	Т	Water	L107-06-1B	360-45018

Report Basis

T = Total

Job Number: 360-22658-1 Client: Olin Corporation

Method Blank - Batch: 360-44554 Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-44554/2 Analysis Batch: 360-44554 Instrument ID: Varian 720 ES ICP Prep Batch: N/A Client Matrix: Water Lab File ID: N/A Units: ug/L Initial Weight/Volume: Dilution: 1.0

Date Analyzed: 05/18/2009 1158 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte	Result	Qual	MDL	RL
Aluminum	ND		2.2	100
Chromium	ND		0.17	5.0

Lab Control Sample/ Method: 6010B Lab Control Sample Duplicate Recovery Report - Batch: 360-44554 Preparation: N/A

LCS Lab Sample ID: LCS 360-44554/1 Analysis Batch: 360-44554 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

Date Analyzed: 05/18/2009 1155 Final Weight/Volume: 10 mL

Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-44554/8 Analysis Batch: 360-44554 Instrument ID: Varian 720 ES ICP

Prep Batch: N/A Client Matrix: Water Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 05/18/2009 1230 Final Weight/Volume: 10 mL Date Analyzed:

Date Prepared: N/A

% Rec. **RPD** RPD Limit LCS Qual LCSD Qual Analyte LCS LCSD Limit Aluminum 100 94 80 - 120 6 20 Chromium 99 96 80 - 120 3 20

Client: Olin Corporation Job Number: 360-22658-1

Matrix Spike/ Method: 6010B
Matrix Spike Duplicate Recovery Report - Batch: 360-44554 Preparation: N/A

MS Lab Sample ID: 360-22658-8 Analysis Batch: 360-44554 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 05/18/2009 1218 Final Weight/Volume: 10 mL
Date Prepared: N/A

MSD Lab Sample ID: 360-22658-8 Analysis Batch: 360-44554 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 05/18/2009 1221 Final Weight/Volume: 10 mL Date Prepared: N/A

% Rec. MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Analyte Aluminum 75 - 125 97 98 20 1 Chromium 98 99 75 - 125 0 20

Instrument ID: No Equipment Assigned

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44617 Method: 300.0 Preparation: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/19/2009 1701 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analysis Batch: 360-44617

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44617 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44617/2 Analysis Batch: 360-44617 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/19/2009 1716 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual Sulfate 0.08 82.7 85 - 115 103 40.0 85 - 115 Chloride 40.8 102

Calculations are performed before rounding to avoid round-off errors in calculated results.

Lab Sample ID: MB 360-44617/1

85 - 115

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44619 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44619/1 Analysis Batch: 360-44619 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/19/2009 2334 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44619 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44619/2 Analysis Batch: 360-44619 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

40.0

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/19/2009 2349 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual
Sulfate 80.0 83.1 104 85 - 115

41.0

103

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-22658-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-44619 Preparation: N/A

MS Lab Sample ID: 360-22658-8 Analysis Batch: 360-44619 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 0034 Final Weight/Volume: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-22658-8 Analysis Batch: 360-44619 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

106

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 0049 Final Weight/Volume: 10 mL
Date Prepared: N/A

105

 Analyte
 MS
 MSD
 Limit
 RPD
 RPD Limit
 MS Qual
 MSD Qual

 Sulfate
 103
 102
 75 - 125
 1
 20

75 - 125

1

20

85 - 115

85 - 115

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44926 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44926/1 Analysis Batch: 360-44926 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 1559 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44926 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44926/2 Analysis Batch: 360-44926 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

0.08

40.0

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 1614 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual

82.5

41.1

103

103

Calculations are performed before rounding to avoid round-off errors in calculated results.

Sulfate

Client: Olin Corporation Job Number: 360-22658-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-44926 Preparation: N/A

MS Lab Sample ID: 360-22658-15 Analysis Batch: 360-44926 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 20 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 1659 Final Weight/Volume: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-22658-15 Analysis Batch: 360-44926 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 20 Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/20/2009 1715 Final Weight/Volume: 10 mL
Date Prepared: N/A

% Rec. MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Analyte Sulfate 75 - 125 109 108 0 20 Chloride 107 107 75 - 125 0 20

85 - 115

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44933 Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-44933/1 Analysis Batch: 360-44933 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/21/2009 2245 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Sulfate
 ND
 2.0
 2.0

 Chloride
 ND
 1.0
 1.0

Lab Control Sample - Batch: 360-44933 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-44933/2 Analysis Batch: 360-44933 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

40.0

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 05/21/2009 2300 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual
Sulfate 80.0 82.8 104 85 - 115

41.2

103

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44909 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-44909/1-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/28/2009 1408 Date Prepared: 05/28/2009 1110 Analysis Batch: 360-44916

Prep Batch: 360-44909

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL	
Ammonia	ND		0.10	0.10	

Lab Control Sample - Batch: 360-44909 Method: L107-06-1B

**Preparation: Distill/Ammonia** 

Lab Sample ID: LCS 360-44909/2-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/28/2009 1409 Date Prepared: 05/28/2009 1110 Analysis Batch: 360-44916 Prep Batch: 360-44909

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.71	97	85 - 115	

Matrix Spike/ Method: L107-06-1B

Matrix Spike Duplicate Recovery Report - Batch: 360-44909 Preparation: Distill/Ammonia

watrix Opine Duplicate Necovery Neport - Datch. 300-44303

MS Lab Sample ID: 360-22658-8MS

Client Matrix: Water Dilution: 5.0

Date Analyzed: 05/28/2009 1434 Date Prepared: 05/28/2009 1110 Analysis Batch: 360-44916 Prep Batch: 360-44909 Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-22658-8MSD

Client Matrix: Water Dilution: 5.0

Date Analyzed: 05/28/2009 1435 Date Prepared: 05/28/2009 1110 Analysis Batch: 360-44916

Prep Batch: 360-44909

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

<u>% Rec.</u>

Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual MSD Qual
Ammonia	91	160	75 - 125	25	20	F

Calculations are performed before rounding to avoid round-off errors in calculated results.

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Job Number: 360-22658-1 Client: Olin Corporation

Method Blank - Batch: 360-44990 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-44990/1-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/29/2009 1544 Date Prepared: 05/29/2009 1410 Analysis Batch: 360-44996 Prep Batch: 360-44990

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL	
Ammonia	ND		0.10	0.10	

Lab Control Sample - Batch: 360-44990 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-44990/2-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/29/2009 1545

Date Prepared: 05/29/2009 1410

Analysis Batch: 360-44996

Prep Batch: 360-44990

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	10.4	104	85 - 115	

Job Number: 360-22658-1 Client: Olin Corporation

Method Blank - Batch: 360-45018 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-45018/1-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 06/01/2009 1108 Date Prepared: 06/01/2009 0857 Analysis Batch: 360-45027 Prep Batch: 360-45018

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL	
Ammonia	ND		0.10	0.10	

Lab Control Sample - Batch: 360-45018 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-45018/2-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 06/01/2009 1109 Date Prepared: 06/01/2009 0857 Analysis Batch: 360-45027 Prep Batch: 360-45018

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: 1.0 mL Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.41	94	85 - 115	

Client: Olin Corporation Job Number: 360-22658-1

Method Blank - Batch: 360-44548 Method: SM 2510B

Preparation: N/A

Lab Sample ID: MB 360-44548/2 Analysis Batch: 360-44548

Client Matrix: Water Prep Batch: N/A
Dilution: 1.0 Units: umhos/cm

Date Analyzed: 05/18/2009 1103

Date Prepared: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte Result Qual RL RL
Specific Conductance ND 1.0 1.0

Method Blank - Batch: 360-44548 Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-44548/24 Client Matrix: Water Dilution: 1.0

Date Analyzed: 05/18/2009 1137

Date Prepared: N/A

Analysis Batch: 360-44548

Prep Batch: N/A Units: umhos/cm

Instrument ID: No Equipment Assigned

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume: 1.0 mL

Analyte Result Qual RL RL
Specific Conductance ND 1.0 1.0

Client: Olin Corporation Job Number: 360-22658-1

Lab Control Sample - Batch: 360-44548 Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-44548/1 Analysis Batch: 360-44548 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 05/18/2009 1101 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual Specific Conductance 1410 1420 101 85 - 115

Lab Control Sample - Batch: 360-44548 Method: SM 2510B

Preparation: N/A

Lab Sample ID: LCS 360-44548/25 Analysis Batch: 360-44548 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 05/18/2009 1138 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual
Specific Conductance 1410 1390 99 85 - 115

Duplicate - Batch: 360-44548 Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-22658-18

Analysis Batch: 360-44548

Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 05/18/2009 1141 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Sample Result/Qual Result RPD Limit Qual
Specific Conductance 3300 3320 0 20

			State Accreditation				
		New York			Florida	Ī., , <u>,</u> ,	
Method Name	Description	(NELAC)	Mass	Conn	(NELAC)	North Carolina	
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)		NB		NP		
SM 4500 CI F	Chlorine, Residual		NP				
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P				
SM 9215E	Heterotrophic Plate Count (SimPlate)		P				
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P P				
SM 9222B	Coliforms, Total (Membrane Filter)			1			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP P				
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)	NP/P	NP/P	NP/P			
200.8 200.7 Rev 4.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P			
6010B	Metals (ICP)(list upon request)  Metals (ICP)(list upon request)	NP/SW	INF/F	NP/SW			
245.1	Mercury (CVAA)	NP/P	NP	NP/P			
7470A	Mercury (CVAA)	NP	141	NP		+	
7470A 7471A	Mercury (CVAA)	SW		SW			
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P			
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P			
3010A	Preparation, Total Metals	NP/P		NP/P			
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW			
3050B	Preparation, Metals	SW		SW		+	
504.1	EDB, DBCP and 1,2,3-TCP (GC)	3	Р	P	<u> </u>		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		+	
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		+	
3546	Microwave Extraction	SW		1			
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP			
3540C	Soxhlet Extraction			1			
3550B	Ultrasonic Extraction	SW		SW			
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP			
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW			
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW			
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW			
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW			
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW	
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р			
524.2	Trihalomethanes		Р	Р			
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP			
5035	Closed System Purge and Trap	SW		SW			
5030B	Purge and Trap	NP		NP			
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW			
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW	
180.1	Turbidity, Nephelometric		Р	Р			
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P			
410.4	COD	NP	NP	NP			
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW			
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP			
7196A	Chromium, Hexavalent	NP/SW		NP/SW			
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW			
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP			
9040B	рН	NP		NP			
9045C	рН	SW		SW			
L107041C	Nitrogen, Nitrate	NP	Р	NP/P			
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P			
L204001A CN	Cyanide, Total		NP/P	NP/P			
L210-001A	Phenolics, Total Recoverable	NP	NP	NP			
SM 2320B	Alkalinity	NP/P	NP/P	NP/P			
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P			
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P			
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP			
SM 3500 CR D	Chromium, Hexavalent	NP		NP			
SM 4500 H+ B	рН	NP/P	NP/P	NP/P			
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P			
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P			
SM 4500 P E	Phosphorus, Total	NP	NP	NP			
SM 4500 S2 D	Sulfide, Total	NP		NP			
SM 5210B	BOD, 5-Day	NP	NP	NP			
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P			
					_	_	

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory This listing is subject to change based on the laboratories certification standing.

### **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-22658-1

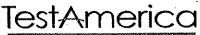
Login Number: 22658 List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.8 C / 4.8 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

### **TestAmerica Laboratories, Inc.**Chain of Custody Form



•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 •149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

THE LEADER IN ENVIRONMENTAL TESTING 366-27658

																	100	b#	25,000	(60 M)	200	20,000	Que	****	Section 1	PO#
Client: Olin Chemical/MA	ACTEC				Proje	ect#:	6	10	0	10	100	<u> </u>	<u>-</u>				305 2504			(Marie de Co	\$100 a 11					
Address: 51 Eames Street				Pro	ject Man	ager:	<u> </u>	<u>ete</u>	<u>~ `</u>	The	»m(	<u>ع ح د</u>	مرد					Sha	ded. \nal							Comments
Wilmington, MA	01887				Wo	rk ID:	PG	MR	51	ررر	با لا	alli	ارُد	ιp	•			heck	analy	sis a	nd s	oecif	y met	thod	Ĺ	(Special Instructions)
Phone:	Fax:	-				ntact:												nd an or exa	•	in c	omm	ents	secti	ion.		MCP case narrative
Requested Turn Are				Regulat	tory Clas				1 :			Rep	ort	or	mat	t			-serie:							
10 Business Day (Std) XX	Rush TAT Requ	ested:	:	NPDES		Drink	ing V	Vate	r		DE	P Fo	rm(:	<del>s)</del>			. [		0-seri						- 1	
15 Business Day	24 hrs	72 hrs	· ˈ	RCRA		MCP	GW	1/S1										se con	nment	s sec	tion to	furth	er de	fine.		
Other	48 hrs	5 Day		Other				_				P Q		: Rr	<u> </u>	<u> </u>						Τ.	,		Н	
Sample Type Codes WW-Wastewater DW-Drinking v _W-Labwater GW-Groundwa S-Solid / Soil SL-Sludge C	ater A-Air	cewate					sıs	r Glass(G)	ج ر <sub>ة</sub>	7 7	5	tive	Т	Nitrogen	Sulfate	Condutivity	Nitrite	ter metals	ter metals	Al/Cr/Fe						:
Sample ID	-	Sample Type	Sampler's Initials	Ti Coll	ate me ected	Grab	# Containers	Plastic(P) or	NaHSO4/MeOH	HINOS to pH	HCI to pH	NaOH to p	NAOH/ZNAC	Ammonia-Nitrogen	Chloride	Sporific C	Nitrate Ni	Groundwater	Surfacewa	Sediment:		Other	Other	Other		Disashad sadala asa Gald Shand
GC-GW-105	6	-W	MAM	513		×	3	P	1	1					< >	۲ <b>۱</b>		Х	Ц				_			Dissolved metals are field filtered.
å - 6w . 20	·	ۍ سځ	DLC	5-13:	<u>35</u>	X	3	P	j	1				, )	X )	χ	٨_	X								Groundwater Metals: Dissolved Al/Cr
oc-Gw-785	C	ĉ٧	DLC	5-13:	<u>:05</u>	X	3	P	_	)   1		Ш		<u>, '</u>	<u> </u>	×,	×	>		_		_	<u> </u>			Surfacewater Metals: Dissolved/Total
00 - GW - 25	Ć	ŞΨ	мдм	5-13-		X	3	ρ		) ]	i			) \	( )	<u> </u>	<u>{                                    </u>	Х			4				1	Al/Cr/Na
OC - PZ-1812.	. (	<u>کال</u>	MAM	5-13	<u>05</u>	X	3	ઈ		)				1	ХX	( ×	$\perp$	×								
oc -GW-39	ļ	ډلا	DLC	5-13-	25	Х	3	٩	,	)	ļ ;			\ \	/   >	<u> </u>	Χ	Х		$\perp$	1					
OC - GW - 345R	C	ĥν	MAM	5-13	٥	X	3	P		1 )				<u> </u>	ΧĮ	X	×	X					_	L		
OC- GW - 34D	-	ru	אנכ	5-13-	<u> </u>	X	<del> </del> -	$\mathcal{P}$		) ]	1		$\perp$	1	<b>Y</b>	X Y	X	X				_		Ļ.	<u> </u>	
OC. GW -34DD	V <sub>1</sub>		DLC	5-13 19:33	Ŝ	·   Y	3	P		1)	<u> </u>		$\perp$		XT.	X	X	X		_	_	_	$\perp$	L	<u> </u>	
00-GW-34MS		bw.	DYC	141.3	<u>۶٦</u>	χ	3	P		/ C				,	<u>۲</u> ۱	Χ,	X	Y								
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Relinquished by:	all	ای	CC Pate	;	Time	کُّے	Re	ceiy	ed by	<i>/</i> :	$\mathcal{I}$	1	4	1				iate; √S/2	7 <u>5</u>			ime 5		>_		Preservation/pH checked
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### **TestAmerica Laboratories, Inc.**Chain of Custody Form



•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 ◆149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

THE LEADER IN ENVIRONMENTAL TESTING 360 27658

Client: Olin Chemical/MACTEC	Project #:	61007	1090016		Jop#	Quote#	PO#
Address: 51 Eames Street	_ Project Manager:	Peter	Thompson	1	Shaded areas for Analysis Red	The state of the s	Comments
Wilmington, MA 01887	 Work ID:•	PCMP Sla	in, wall loa	P	Check analysis and spe	cify method	(Special Instructions)
Phone: Fax:		David Cha	•		and analytes in comme For example:	nts section.	MCP case narrative
Requested Turn Around Time	Regulatory Classifica		Special Report F	ormat	500-series for drinking 600-series for waste w		
10 Business Day (Std) XX Rush TAT Requested:			DEP Form(s		8000-series for haz/so	id waste	
15 Business Day 24 hrs 72 hrs Other 48 hrs 5 Day	RCRA — MCP	GW1/S1 —	—— MWRA Smar —— MCP QA/QC		Use comments section to f	urther define.	
Other          48 hrs          5 Day            Sample Type Codes	Outer		Preservative		(0 (0 )		
WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air		H(C)			metals metals /Cr/Fe		
S-Solid / Soil SL-Sludge O-Oil Z-Other		₩ 0	HNO3 to pH <2 H2SO4 to pH <2 HCI to pH <2 NaOH to pH >12 NAOH/ZNAC	Ammonia-Nitrogen Chloride, Sulfate Specific Condutivity	er m		
ν	Date	# Containers Plastic(P) or G NaHSO4/Me	HNO3 to pH H2SO4 to pH HCI to pH <2 NaOH to pH > NAOHZNAC NAOHZNAC	e, S	Nitrate, Nitrite Groundwater Surfacewater Sediment: Al/ Other		
Sample ID Sample Sampler's Sampler's Initials	Time a di	onta stic(F	HNO3 to p H2SO4 to HCI to pH NaOH to p NAOH/ZN/	Ammonia Chloride, Specific (	Nitrate, Nitr Groundwat Surfacewal Sediment: . Other		
Samp Type Samp Samp	Time que o	# C Plas	HOSO HCI to NaOH NAOH	문 등 양	Nitrate Groun Surfac Other	Other Other Other	
BC-GW-34MSD BWDLL	5-13-09 X	3 P		XXX			Dissolved metals are field filtered.
GC-GW-34MSD GW DLL GE-GW-55 S GW MAN	C 111-C1C	3 P	7 /	XXX	X		Groundwater Metals: Dissolved Al/Cr
OC-PZ-ITER ON MAN	177.00	3 p	1 / 1	γ×∨	X		Surfacewater Metals: Dissolved/Total
OG-GW-CA) GN DLC	5-14-09 X	3 p	1 1	ХХУ	X     .		Al/Cr/Na
00-GW-785 GW MAN	<u>   /人・3つ      </u>	3 P	) ) )	XXX			
oc-Gw-24 GW DLC	5-14-09 y	3ρ,	S S, ,	XXX	1   4   1   1		
GC-GW-211  GC-GW-211  GC-GW-216RR  GWMAN	15-121-05 X	3 P		XXX	1		
BC-GW-202D GW 2020	09:20	3 P	1 1	XXV	X		
OC-GW-202D. GW MAN	5-15-09 Y	3 P	) ( )	XXX	1	,	
OC-GW-795 Gh DLC		3 P	h i li	XXX			
Sampled by (print):	· t	Signature.	1 12 -				Cooler ? (Y) N Samples Iced? (V) N
David Chapman Mark Maggiore Relinguished by: Dat	e: Time:	Received	V. Affins	7	Date: Tir	ne:	
11.00.000.000.000.000	-15-9 14:0c		eru /	ی بلا	7/15/09	1245	Temp @ receipt: 29°2 48 °C
Relinquisted by:  Part July 5/45		Received b		· ·	Date: Tir		Preservation/pH checked
Method of shipment	1625	Test	America-V		<del></del>		By: # Date: 5/15/01

## Version 3, October 2008

## STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Specific Com

chlorish solfot, ammoria

Chris Ricard 360-2265P-Project # Con 30500/c Sr. Review/Date Reviewer/Date Lab Report #

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, values stinulated in the OAPP. Where the QAPP does

	however, may not list QA/QC criteria for every chemical analysis. Where not defined by IMADEF, criteria will default to write in the CAFF. Where include the criteria, QA/QC requirements will default to limits employed by the laboratory.	' MADEP, criteria will default to values supulated in the QAFF. Where the
1.0	Laboratory Deliverable Requirements	
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received.	ort? Yes [
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone # ☐ Client Information: ☐ Name ☐ Address ☐ Client Contact	Sample identification – Field and Laboratory (IDs must be cross-referenced)
ACTI	ACTION: If no, contact lab for submission of missing or illegible information.	
	1.2 Laboratory Report Certification Statement	Yes [ J No [ ] N/A [ ] Comments:
	Does the laboratory report include a completed Analytical Report Certification in the required format?	the required format?
ACTI	ACTION: If no, contact lab for submission of missing certification or certification with correct format.	ect format.
	1.3 Laboratory Case Narrative:	Yes [ J No [ ] N/A [ ] Comments:
	☐ Narrative serves as an exception report for the project and method QA/QC performance.	ance. ☐ Narrative includes an explanation of each discrepancy on th
		Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

0

1.4 Chain of Custody (COC) copy present with all documentation completed?

Comments:

N/A[

No [

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

S:	ent does not apply).	¥	# 2.5				:53	:S:
Comments:	ure requirem	Comments:					Comments:	Comments:
N/A	ion, temperat	N/A [_]					N/A [	N/A
Yes \( \sqrt{\sq}}}}}}}}}}}}} \signtimesept\signtiftit{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}}} \end{\sqnt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}\eq}}}}}}}}} \end{\sqitititit{\sintitta}}}}}}}} \end{\sqititititititititit{\sint{\eqs}}}}}}}	lay as collect renced	No.					No.	No.
Yes 🖊	n the same of	Yes 🗹					Yes [	Yes
	E Sample temperature confirmed: must be 1° − 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).  Container type noted □Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced	ACTION: If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were the correct bottles and preservatives used?  Annmonia,—1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Oil & Grease—1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C	Chemical Oxygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C ———————————————————————————————————	Organic Carbon – 500 mL amber glass bottle/HCl or $\rm H_2SO_4$ to pH<2,cool to 4°C Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C	Phenolics - $\rm H_2SO_4$ to pH<2, cool to 4°C Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C	ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment	1.5.2 Were all samples delivered to the laboratory without breakage?	1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

## WET CHEMISTRY PARAMETERS BY VARIOUS METHODS STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION OLIN-WILMINGTON

in the lab	N/A [ ] Comments:	口 Dilution Factor		Comments:	(e)		**************************************
nitia retho	Yes [ No [	☐ Dilution Factor ☐ % m ☐ Date of preparation/extraction/digestion cles ☐ Units (soils must be reported in dry weight)		atory report Yes [ No [ ] N/A [ ]	/ Laboratory duplicate results (where applicabl		
	Vas the following information supplied in the	☐ Date and time collected ☐ Analyst Initials ☐ Analysis method ☐ Preparation method ☐ Target analytes and concentrations	ACTION: If no, contact lab for submission of missing or incomplete information.	ne following information provided in the labora		ACTION: If no, contact lab for submission of missing or incomplete information.	

Nitrate nitrogen as N = 48 hrs 28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate Comments: Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows: N/A No pH = analyze immediately Yes [ ] Nitrate + Nitrite as N = 28 days Sulfide, TDS, TSS = 7 days Nitrite nitrogen as N = 48 hrs Alkalinity = 14 days Holding Times 2.0

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

Laboratory Method 3.0

Comments:

No[] N/A[]

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

IN NO [2] N/A[] Comments: The energy of a Par for specific confustors	I wonder four . No exten regularly.	Bicarbonate Alkalinity** $\square = 1 \text{ mg/L}$ Carbonate Alkalinity** $\square = 1 \text{ mg/L}$	Chloride* $\Box = 1 \text{ mg/L}$ Hardness * $\Box = 2 \text{ mg/L}$	Oil & Grease* $\square = 5.5 \text{ mg/L}$ Sulfate (EPA 300.0)* $\square \neq 2 \text{ mg/L}$	$10 \text{ mg/L}$ TSS* $\square = 5 \text{ mg/L}$				PQL is indeterminate, contact lab for explanation.	, and contact lab for resubmission of the missing data	d No [ ] N/A [ ] Comments:		No [] N/A [] Comments:	No [] N/A [] Comments:
quantitation limits the same as those specified by the Yes [	or wet chemistry analyses, Where the QAPP does not by the lab**. Other criteria	Alkalinity** $\square = 1 \text{ mg/L}$ Bicarbona	Nitrite Nitrogen as $N^* \square = .01 \text{ mg/L}$ Chloride*	Total Organic Carbon** $\Box = 1 \text{ mg/L}$ Oil & Gr	$COD^* High - 50 mg/L \square$ $TDS^* \square = 10 mg/L$	Phenolic - 0.01 mg/L	PQL = Dounce of PQL =	POL = Cource of PQL =	ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.  3.3 Are the appropriate parameter results present for each sample in the SDG?  Yes Low No Low No Low Comments:	ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data	Ses L 少 Yes L 少		Ass [	<ul> <li>4.1 Are the Method Blank Summaries present?</li> <li>№ If no, call the laboratory for submission of missing data.</li> <li>4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of Yes []</li> </ul>
3.2 Are the practical quantitation □ QAPP/IRSWP □ Lab?	Note: The MADEP QA/QC Guidelines do not yet list PQLs for therefore all criteria will default to values stipulated in the QAPP*. define criteria, QA/QC requirements default to limits employed may also apply.	Ammonia* $\square = 0.1 \text{ mg/ L}$	Nitrate Nitrogen as $N^* \square = .05 \text{ mg/L}$	Spec. Cond.** X 3 umhos/cm	COD:* Low - 20 mg/L	pH* □ <2 to > 12	Other parameter(list)	Other parameter (list)	ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, r 3.3 Are the appropriate parameter results present for each sample in the SDG?	ACTION: If no, check Request for Analysis to ve	3.4 If dilutions were required, were dilution factors reported?	ACTION: If no, contact the lab for submission.	4.0 Method Blanks	4.1 Are the Method Blank Summaries present? ACTION: If no, call the laboratory for submission of missing data. 4.2 Was a method blank analyzed for each analysis batch

# LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS OLIN-WILMINGTON

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.	ior chemist fo	r action nee	ded.			
4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).	Yes [ ]	No	N/A	Comments:		
4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data	Yes	No [	N/A [	Comments:		
according to the rottowing. If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.						
If the sample concentration is $> 5 \times \text{blank}$ value, no qualification is needed.						
ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.	agging level =	= 5 × blank	value) on the c	hecklist. List all	affected samples and thei	H
5.0 Laboratory Control Standards	28 1					
5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes [ ]	] %	N/A	Comments:	45	
ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.						
5.2 Is a LCS Summary Form present?	Yes [Z	] °N	N/A [	Comments:		
ACTION: If no, contact lab for resubmission of missing data.						
5.3 Is any wet chemistry analyte LCS recovery outside the control limits?	Yes	No [	N/A [	Comments:		

WET CHEM.doc

page 4

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Alka Tota COJ Hare	Alkalinity** $\Box = 80-120\%$ Total Organic Carbon** $\Box = 80-120\%$ COD Low* $\Box = 80-120\%$ Hardness* $\Box = 80-120\%$	Bicarbonate Alkalinity** $\Box = 80-120\%$ TDS** $\Box = 80-120\%$ COD High* $\Box = 80-120\%$ Chloride* $\Box = 80-120\%$	Carbonate Alkalinity** $\square = 80-120\%$ Oil & Grease* $\square = 80-120\%$ Nitrate Nitrogen as N** $\square = 80-120\%$ Sulfate (EPA 300.0)* $\square = 80-120\%$	Specific Conductivity * $\square$ = 80-120% Ammonia Nitrogen as N* $\square$ =80-120% Nitrite Nitrogen as N** $\square$ = 80-120% pH* $\square$ = 98-102% TSS* NA
Othe	Other parameter(list)	%R =	□ Rec Limits=	
Otho	Other parameter(list)	%R =	□ Rec Limits =	
		(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	ry limits for wet chemistry analyses.)	
ACTION: Is within the bat	ACTION: If recovery is above the upper limit, qualify all positive sample results viithin the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).	ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results are rejected (R).	atch as (J). If recovery is below the lower li	mit, qualify all positive and no-detect results
6.0 <u>Ma</u>	Matrix Spikes			
Matrix spike specific sch	s may be collected at different fidules. Confirm spike requireme	Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.	ır task	
6.1 ACTION: If	6.1 Were project-specific MS/MSDs analyzed? List pr ACTION: If no, contact senior chemist to see if any were specified.	Were project-specific MS/MSDs analyzed? List project samples that were spiked. contact senior chemist to see if any were specified.	Yes No	Comments: Sange OC-6-lu-34
6.2 ACTION: II	6.2 Is the MS/MSD Recovery Form present?  ACTION: If no, contact lab for resubmission of missing data.	n present? missing data.	Ves [] No [] N/A []	his/mis) and yet on sayole of - Petle R.R  N/A [ ] Comments:
6.3	Were matrix spikes analyzed matrix?	Were matrix spikes analyzed at the required frequency of 1 per $20$ samples permatrix?	es per Yes [	Comments:
ACTION: IS	ACTION: If any matrix spike data is missing, call lab for resubmission.	ll lab for resubmission.		
6.4	Are any wet chemistry analyte spike recoveries outside	spike recoveries outside of the QC limits?	Yes   1 No   NA   1	Comments:
F	The MSD preek vecous for amon	for amonia (60) great	week is great than the	you Or ant of the

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WET CHEM. doc

	NOTE: $%R = (S)$	(SSR-SR) x 100%	Where: SSR = Spiked sample SR = Sample	result result
	vo	SA = Spike added		
	Alkalinity* = NA Chloride*(SM 4500 Cl) 🗹= 75-125%	Bicarbonate Alkalinity* = NA Specific Conductivity * = NA	Carbonate alkalinity* = NA  Total Organic Carbon* = NA  TDS** = NA  TDS** = NA  Nitrate Nitrogen as N** $\square = 75-125\%$	
	Oil & Grease* = NA Nitrite Nitrogen as N** $\square = 75-125\%$ Other parameter(list)	CUD Low* $\Box = 75-125\%$ Hardness* $\Box = 75-125\%$	75-125% Rec Limi	
	* = Laboratory Limits **=	** = $Olin QAPP Limits$ (MADEP has no	(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)	
CTI	NOTES: 1) If only one of the recoveries for an MS/MSD pair 2) If the MS/MSD was performed by the laboratory on CTION: MS/MSD flags only apply to the sample spiked. Do not evaluality positive results as estimated (J). If the recoveries of the MS and the contract the recoveries of the MS and the contract the results as	1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is ne 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required. SD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the relational section is as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 100 miles are considered inneadle and flagged (R).	NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.  2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.  ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit but > 30%, qualify both positive results and non-detects (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the	flags. I limit If the
CTI Valua	ACTION: Laboratory control limits apply when spiked sample results valuated, but no flags are applied.	spiked sample results fall within the nor	fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is	data is
ă.	MSD recove	ries outside of the QA/QC limits? Where S = MS result	Yes [V] No [] N/A [] Comments:	
		† Ħ	The ammonia MS/MID RPD (OF) exceeds the	
	MS/MSD RPD Limits:	びしめ	anit of 20: The result for amount in	۲.
	RPD <20	Kno out	the unspiked sangles OC-GW-340 and OC-GW-340 DUP	500
0.	Laboratory Duplicate	A again	were zerlitich estimated (5).	
	Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?	tes <20% unless otherwise specified bel	low? Yes [ No [ ] N/A [ ] Comments:	

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alialyte as estimated (5).	%9 = □ **SSL
man specified minus, quanty an resums for mar	Specific Conductivity *[3 = 5%
ACTION: If the KFD is greater	pH* □ = 3%

%9 = □ \*\*SQL

# Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

Comments:

N/A[]

Comments:

N/AI Z

No.

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

## 9.0 Field Duplicates

- Were field duplicate samples collected? Obtain a list of samples and their associate field duplicates.
- 9.2 Were field duplicates collected per the required frequency?

MADEP Option 1(1 per 20) IF

QAPP/IRSWP E

MADEP Option 3 (1 per 10)

9.3 Was the RPD  $\leq$  30% for waters  $\leq$  50% for soils? Calculate the RPD for results an attach to this review.

0 00%		(%)
Semple		4
Comments:	Comments:	Comments:
Yes [] No [] N/A [] Comments: Sample OC-Qu-340 and OC-GU-340 DUP	Yes [ No [ ] N/A [ ] Comments:	nd Yes No No N/A Comments:
No[]	] %	No
	Yes [	Yes
ted		pu

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Was any of the data qualified?	Yes	No [	N/A	Comments:
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.				

## REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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## Version 1.2, Nov 2002

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date MMM/ Clark 7/28/6 Sr. Review/Date Chris Clock A 8/26/06 Lab Report # 3cc-2265P-1 Project # 610 7070216

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Laboratory Deliverable Requirements
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Comments:	and Laboratory enced)		Comments:			Comments:	des an explanatior	Certification Statement.
No N/A	Sample identification – Field and Laboratory (IDs must be cross-referenced)		Yes [ No [ ] N/A[ ]			Yes [	☐ Narrative inclu	Certific
ort? Yes	one #      Sample □ Client Contact (1		Ves [W	ired format?	rect format.	Ves [	oerformance.	
te laboratory repo	□ Ph	mation.		ation in the requ	ification with con	\$3.0	nethod QA/QC µ	
e following provided in the	☐ Project ID ☐ Address	nissing or illegible infor	tatement	ınalytical Report Certific	sing certification or certi		Narrative serves as an exception report for the project and method QA/QC performance. he	
ion: Was all of th	Address Name	submission of n	Certification Si	le a completed $A$	ubmission of mis	Varrative:	an exception re	
1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes \[ \inf \] No \[ \] N/A \[ \] Check items received.	☐ Name of Laboratory Client Information:	ACTION: If no, contact lab for submission of missing or illegible information.	1.2 Laboratory Report Certification Statement	Does the laboratory report include a completed Analytical Report Certification in the required format?	ACTION: If no, contact lab for submission of missing certification or certification with correct format.	1.3 Laboratory Case Narrative:	☐ Narrative serves as on the	

Comments:

Yes [ No [ N/A [

1.4 Chain of Custody (COC) copy present with all documentation completed

ACTION: If no, contact lab for submission of copy of completed COC.

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of missing or illegible information.

of the following tasks completed and recorded upon receipt of the sample(s) oratory?  The confirmed is sample to the following tasks completed and recorded upon receipt of the sample(s) oratory?  The confirmed is sample to complete the sample seer sent by courier and delivered on the same day as collection, temperature require the confirmed is sample condition observed of pH verified (where applicable) of Frield and lab IDs cross referenced in the for submission of missing or incomplete documentation.  Were all samples delivered to the laboratory without breakage?  The Laboratory with sample receipt, condition of the samples, analytical problems or special in the receipt, condition of the data?  The Laboratory is analytical problems or special in the results Section: Was each of the following requirements supplied in the results report for each sample?	He sample(s)  The sample(s)  The same day as collection, temperate and delivered on the same day as collection, temperate and lab IDs cross referenced  The problems  The	S:	ement does not apply).		<b>:</b> %	<b>:</b> ;	<u>;;</u>
of the following tasks completed and recorded upon receipt of the sample(s) oratory?  The following tasks completed and recorded upon receipt of the sample(s) oratory?  The confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, tempored oration observed of pH verified (where applicable) of Field and lab IDs cross referenced on the sample condition observed or incomplete documentation.  Were all samples delivered to the laboratory without breakage?  Were all samples delivered to the laboratory without breakage?  The color Receipt Form or Lab Narrative indicate other problems or special very condition of the samples, analytical problems or special circumstances affecting the quality of the data?  The Results Section: Was each of the following requirements supplied in the very or No location of the sample?	see each of the following tasks completed and recorded upon receipt of the sample(s)  of the laboratory?  If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were all samples delivered to the laboratory without breakage?  1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?  Sample Results Section: Was each of the following requirements supplied in the Yes \( \sum \) No \( \sum \) N/A \( \sum \) laboratory report for each sample?	Comments:	erature require		Comments:	Comments:	Comments:
of the following tasks completed and recorded upon receipt of the sample(s) oratory?  of the following tasks completed and recorded upon receipt of the sample(s) oratory?  In confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as context of the sample condition observed \(\overline{\text{P}}\) pH verified (where applicable) \(\overline{\text{P}}\) Field and lab IDs cross referentiated by submission of missing or incomplete documentation.  Were all samples delivered to the laboratory without breakage?  Were all samples delivered to the laboratory without breakage?  The \(\overline{\text{N}}\) No \(\overline{\text{C}}\) No \(\overline{\text{C}}\) and the quality of the data?  Boes the Cooler Receipt Form or Lab Narrative indicate other problems or special very condition of the samples, analytical problems or special very \(\overline{\text{P}}\) No \(\overline{\text{C}}\) and \(\overline{\text{P}}\) No \(\overline{\text{C}}\) and \(\overline{\text{P}}\) No \(\overline{\text{C}}\) and \(\overline{\text{P}}\) no \(\overline{\text{P}}\) in \(\o	Sample Receipt Information (Cooler Receipt Form present?):  Yes []  No [  The laboratory?  Type noted [  Type note	N/A	llection, tempe nced		] N/A	. N/A[]	
le Receipt Information (Cooler Receipt Form present?):  of the following tasks completed and recorded upon receipt of the sample(s) oratory?  The confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the steed I sample condition observed I pH verified (where applicable) I Field and lab I of submission of missing or incomplete documentation.  Were all samples delivered to the laboratory without breakage?  Were all sample receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special receipt, condition of the data?  The Results Section: Was each of the following requirements supplied in the Yes Lory report for each sample?	Sample Receipt Information (Cooler Receipt Form present?):  Yes [  ere each of the following tasks completed and recorded upon receipt of the sample(s) o the laboratory?  emperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the semperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the rype noted     1.5.1   Were all samples delivered to the laboratory without breakage?   Yes     1.5.2   Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special   Yes     2.5.2   Sample Results Section: Was each of the following requirements supplied in the   Yes     2.5.4   Sample Results Section: Was each of the following requirements supplied in the   Yes     3.5.5   Sample Results Section: Was each of the following requirements supplied in the   Yes     3.5.6   Sample Results Section: Was each of the following requirements supplied in the   Yes     3.5.7   Yes     4.5.8     5.5.8	] % V	same day as co Ds cross refere		] ou	∑] № □	
te Receipt Information (Cooler Receipt Form present?):  of the following tasks completed and recorded upon receipt of the san oratory?  ure confirmed: must be 1° − 10° C. (If samples were sent by courier and de use confirmed: must be 1° − 10° C. (If samples were sent by courier and de use confirmed: must be 1° − 10° C. (If samples were sent by courier and de use all sample condition observed □ pH verified (where applicable) □ were all samples delivered to the laboratory without breakage?  Does the Cooler Receipt Form or Lab Narrative indicate other prowith sample receipt, condition of the samples, analytical problems or scircumstances affecting the quality of the data?  In Results Section: Was each of the following requirements supplied tory report for each sample?	ere each of the following tasks completed and recorded upon receipt of the san o the laboratory?  emperature confirmed: must be 1° − 10° C. (If samples were sent by courier and de emperature confirmed: must be 1° − 10° C. (If samples were sent by courier and de r type noted □ sample condition observed □ pH verified (where applicable) □  If no, contact lab for submission of missing or incomplete documentation.  I.5.1 Were all samples delivered to the laboratory without breakage?  1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other provith sample receipt, condition of the samples, analytical problems or scircumstances affecting the quality of the data?  Sample Results Section: Was each of the following requirements supplied laboratory report for each sample?		livered on the s Field and lab D		Yes		
	s Sampl ere each o the labe emperatu r type no If no, col 1.5.1 1.5.2 sampl	e Keceipt Information (Cooler Receipt Form presents):  of the following tasks completed and recorded upon receipt of the san	oratory?  re confirmed: must be $1^{\circ} - 10^{\circ}$ C. (If samples were sent by courier and de ted $\square$ sample condition observed $\square$ pH verified (where applicable) $\square$ ?	ntact lab for submission of missing or incomplete documentation.	Were all samples delivered to the laboratory without breakage?	Does the Cooler Receipt Form or Lab Narrative indicate other prowith sample receipt, condition of the samples, analytical problems or scircumstances affecting the quality of the data?	le Results Section: Was each of the following requirements supplied ory report for each sample?

ACTION: If no, contact lab for submission of missing or incomplete information.

Field ID and Lab ID

Clean-up method

Matrix

Reporting limits

od Z Date of preparation/extraction/digestion clean-up and analysis, where applicable Z Units (soils must be reported in dry weight)

M % moisture or solids

D Dilution Factor

Preparation method

Analyst Initials

Comments: No[] N/A[] 1.7 QA/QC Information: Was each of the following information supplied in the Yes |

回 Method blank results 口LCS recoveries 回 MS/MSD recoveries and RPDs 口Laboratory	区 Laboratory duplicate results (where applicable)	
ACTION: If no, contact lab for submission of missing or incomplete information.		
2.0 Holding Times		
Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil.	Yes [ ] No [ N/A ] Comments:	
NOTE: List samples that exceed hold time with # of days exceeded on checklist		
ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.		
3.0 Laboratory Method		
3.1 Was the correct laboratory method used?	Yes [ No [ N/A [ Comments:	
Water Digestion 3005A or 3010A or 3020A Soil Digestion 3050B Metals 6010B or 200.7		
ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.		
3.2 Are the practical quantitation limits the same as those specified by the □ SOW ☐ QAPP □ Lab □ MADEP	Yes [ ] No [ ] N/A [ ] Comments:	
NOTE: Verify that the reported metals match the target list specified on the COC.		

# STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7 OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1

JON: If no, evaluate variation with respect to sample matrix, preparation, diluture, etc. If sample PQL is indeterminate, contact lab for explanation.	tion,	
no, evaluate variation with respect to sample mai If sample PQL is indeterminate, contact lab for e	paration, dilu	tion.
no, evaluate variation with respec If sample PQL is indeterminate, o	ole matrix, pre	b for explana
no, evalua If sample	spect to samp	ate, contact la
no, evalua If sample	riation with re	is indetermin
TON: If no ture, etc. If	o, evaluate va	sample PQL
ACT mois	CTION	oisture, etc. If

33	Are results present for each sample in the SDG?	Yes [\textsize] No [\textsize]	N/A[_]	Comments:	
ACTION: If	ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data	was sent, and contact la	b for resubmi	ssion of the missing da	<u> </u>
3.4	If dilutions were required, were dilution factors reported?	Yes [] No []	N/A	Comments:	
ACTION: If	ACTION: If no, contact the lab for submission.				
4.0 Met	Method Blanks				
		N			
4.1	Is the Method Blank Summary present?	Yes [ ] No [ ]	N/A	Comments:	
ACTION:	ACTION: If no, call the laboratory for submission of missing data.				
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes [	N/A [_]	Comments:	
ACTION: needed. Na	ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.				
4.3	Is the method blank less than the PQLs for all target elements?	1		i i	
NOTE: MA samples	NOTE: MADEP requires the method blank to be matrix matched and digested with the samples	Yes No NA	N/A A	Comments:	
<b>4.4</b> the fo	4.4 Do any method blanks have positive results for metals? Qualify data according to the following:	Yes No LA N/A []	N/A	Comments:	

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

-		
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	Comments:		Comments:			
	N/A	_	N/A [			
\	] ºN		No [			
	Yes [		Yes			
full target, second source LCS is required by MADEP. Call laboratory for LCS form submittal. If data are not available, use al judgement to evaluate data accuracy associated with that batch.	Is a LCS Summary Form present?	If no, contact lab for resubmission of missing data.	Is the recovery of any analyte outside of MADEP control limits?  MADEP			within Lab generated limits
NOTE: A ½ ACTION: professiona	5.2	ACTION:	5.3	Samp	Wate	Soil
	NOTE: A <u>full</u> target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.	NOTE: A full target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.  5.2 Is a LCS Summary Form present?  Yes \( \text{No} \) \( \text{No} \) \( \text{L} \)	ailable, use	ailable, use	ailable, use	ailable, use

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is <30%, positive and non-

detect results are rejected (R).

Comments:

5 of 10

## STANDARD OPERATING PROCEDURE AND CHECKLIST LEVEL I DATA QUALITY EVALUATION - OPTION 1 ICP METALS BY METHOD 6010B/200.7 **OLIN CORPORATION**

## Matrix Spikes 0.9

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1	Were project-specific MS/MSDs espiked.	ct-speci	fic MS/ľ	MSDs collected	d? List project samples that were	Yes [ No [	N/A[	Comments: Sont	06-6-0340
				•		3	-	٢	

ACTION: If no, contact senior chemist to see if any were specified.

Yes [ ] No [ ] N/A [ ] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. NOTE: A full target, second source MS/MSD is required by MADEP.

Are any metal spike recoveries outside of the QC limits?

Comments:

Yes No No NA

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

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weries for an MS/MSD pair is outside of the	f the recoveries for an	ne of the recoverie
veries fo	f the recoveries fo	ne of the recoverie
	f the reco	If only one of the reco

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J). Yes No No NA Comments: Where: S = MS sample result Are any RPDs for MS/MSD recoveries outside of the QC limits? x 100% S-D NOTE: RPD = 6.5

D = MSD sample result

(S+D)/2

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects

# 7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ ] No [ ] NA [ ] Comments: Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

Yes No NA NA Comments: 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

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AADEP Laboratory Duplicate Sample RPD Criteria:	OAPP RPD
For aqueous results > $5 \times$ RL, RPD must be $\pm 20\%$	20
For aqueous results $< 5 \times RL$ , RPD must be $\leq RL$	20
For soil/sediment results > $5 \times$ RL, RPD must be $\pm 35\%$	20
For soil/sediment results < $5x$ RL, RPD must be $\leq 2x$ RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

# 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of Yes [ ] No [ YA [ ] the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

Yes No N/A Z Comments:

Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

# 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated Yes [v] No [] N/A [] Comments:

Sample OC-CW-34D and field Syphiete OC-GW.34D DUP

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Yes [ No [ ] N/A [ ] Comments:		and Yes Ld No N/A Comments:    Oc. G. C 34D   Comments   Conf. St.   Conf. St.     Oc. G. C 34D   Conf. St.   Conf. St.     Oc. G. C 34D   Conf. St.   Conf. St.     Oc. G. C 34D   Conf. St.     Oc. G. C 34D	ults if the RPD exceeds 50%. The direction of the land of the standard of the land of the standard of the stan		the Yes No MA Comments:
9.2 Were field duplicates collected per the required frequency?  Yes $[$	SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and Yes Ld No L N/A L Comments: attach to this review.	CTION: RPD must be <50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.	Special QA/QC	10.1 Were both total and dissolved metals analysis performed? If so, the Yes \[ \] No \[ \] N/A \[ \] dissolved metal concentration should not exceed that of the total metal.

ACTION: If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

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	Comments:	
\	N/A [ ]	
	No I	
	Yes	
	of the data qualified?	
	any of t	

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

## REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989. U.S. Environmental Protection Agency (USEPA), 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.